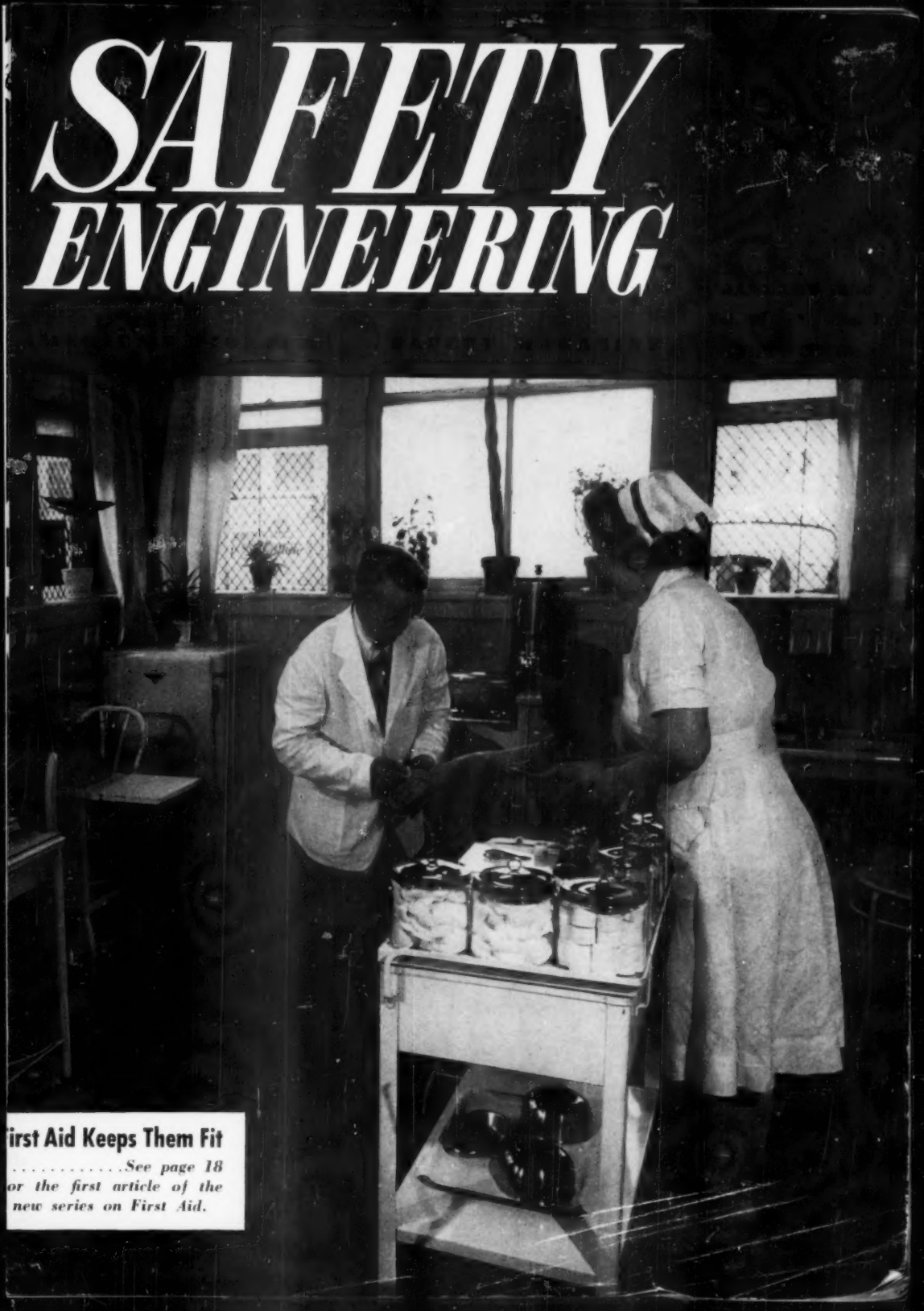
SAFETY ENGINEERING



irst Aid Keeps Them Fit

.....*See page 18*
or the first article of the new series on First Aid.

AO's Twin Cartridge RESPIRATOR

For Organic Vapors, Gases, Dusts...

Gives Double the Protection!

Outstanding . . . for the complete protection it provides and for the utter simplicity of its conversion into any of 7 types of respirators with one basic face piece. If you haven't as yet seen the NEW AO R5000 with new *interchangeable* cartridges and disc filter, be sure to ask your nearest AO Safety Products Representative for a demonstration of this highly serviceable equipment!

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New Filter Retainer Assembly — Takes either chemical cartridges or flat disc of chemically treated felt.

New Face Piece — Non-leaking, snug fitting, comfortable, of durable, pure rubber.

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New Flexible Fitting Brace — Face piece adapts to features of wearer by slightest hand pressure on brace for perfect fit. Headband pressure cannot pull pliable rubber face piece out of shape.

New Inhalation and Drain Valve Designs — Provide positive action, thorough drainage and no interference by clothes or face.

New Inventory Economy — "7-respirators-in-1" permit standardization, hence smaller inventories. Double length headband permits "parking" of respirator around neck when not in use. Auxiliary filters available which extend cartridge filter life.

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SAFETY PRODUCTS DIVISION

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Safety Oxford

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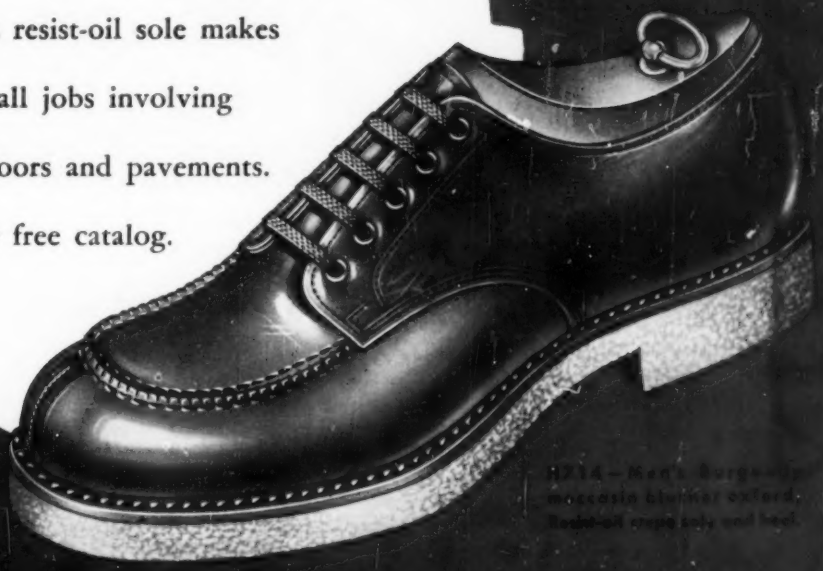

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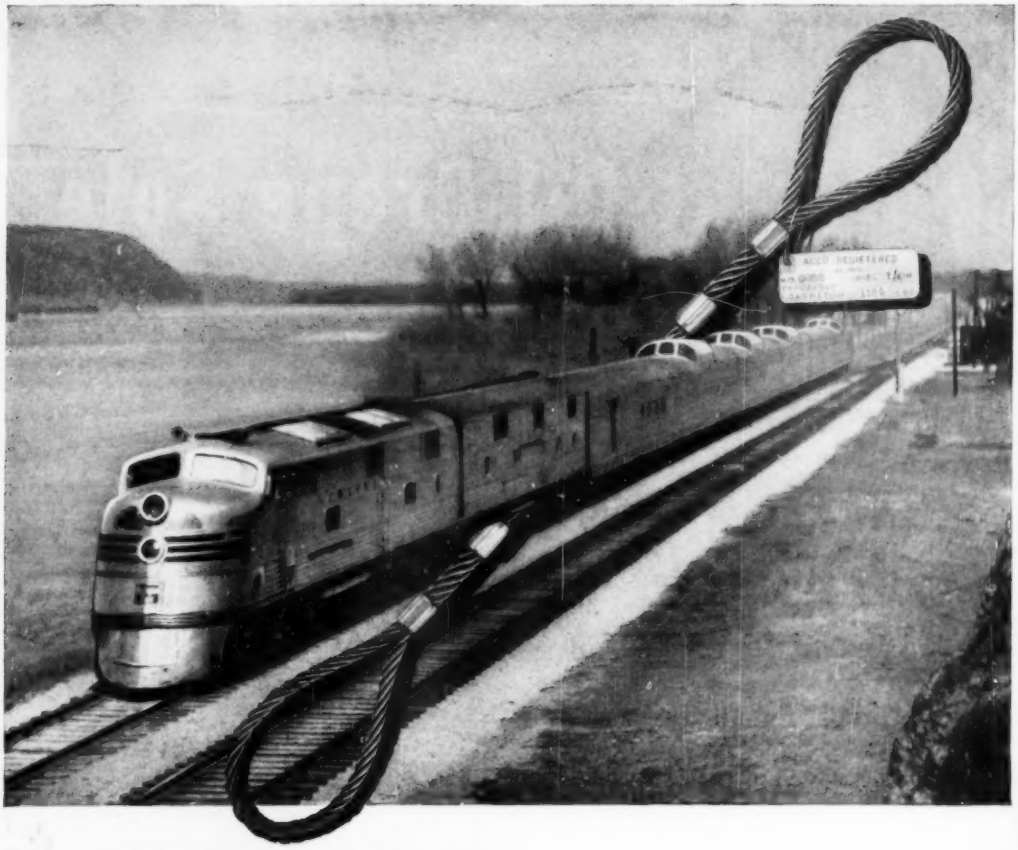

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In Business for Your Safety

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WEIGHS LESS THAN 1 OUNCE

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The sturdy injection-moulded, non-flammable frame provides full protection from impact, dust, flying sparks and chips. Good ventilation and ample air space prevent fogging. Large frontal area gives good range of vision in all directions. Easy-to-adjust elastic headband.

COVERLITE goggles can occupy an important place in your safety program. They are ideal for buffing, polishing, light assembly work and spot welding. Choice of clear, light green and dark transparent frames.

the NEW COVERLITE goggle can be worn over most standard types of personal glasses without interference.

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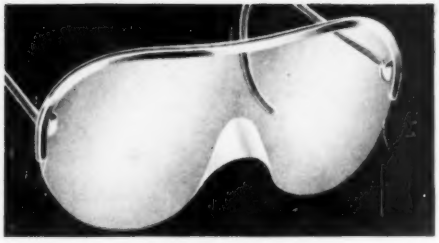

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If you want your investment in safety equipment to pay off—don't neglect comfort in your specifications.

NEW CATALOG

In addition to product information, it contains information on safety glass, filter glass, respiratory hazards, etc., which will help you select proper safety equipment to meet specific hazards. Send for it!

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*T.M.

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Good Outdoor Lighting Will Pay Dividends Too

The reasons for good lighting inside a plant are well known and accepted. The employee who works outside needs light as much as the man who works inside. The better he can see, the better he can work. Better light means less errors, greater safety, and increased production.

If the outdoor lighting around your plant was developed haphazardly—a bare bulb here, an old "dishpan" reflector there—it probably does not give you light where you need it, in the quantities you need. Adequate outdoor lighting can pay you dividends in increased efficiency and better materials handling.

Good outdoor lighting is not difficult to plan, nor is it expensive. Equipment is simple, easily installed, modest in cost. To help you with your planning, General Electric has just prepared a booklet, "Outdoor Lighting for Industrial Plants." It is GEA-3640B. A copy is yours for the asking. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

GENERAL ELECTRIC

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SAFETY ENGINEERING

The Magazine of Safety

Reg. U. S. Pat. Off.

A MONTHLY PUBLICATION DEDICATED TO ACCIDENT PREVENTION, HEALTH CONSERVATION AND FIRE CONTROL.
EST. 1901

VOL. 99, NO. 1 **JANUARY, 1950**

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PICTURE CREDITS
Our Thanks for the Courtesy
Cover: by the Three Lions

AMERICA'S PIONEER SAFETY MAGAZINE
SAFETY ENGINEERING is indexed regularly by Engineering Index, Inc., New York

2½ TONS OF HYDRO EQUIPMENT dropped on this one when rigger slipped as load descended. The sole was outlined in the planking. The steel toe box was flattened on top. But the man's toes weren't even marked.

5500 LB. COIL of strip steel came down too fast and caught the toe of this Lehigh. When they got it up they found the workman had a bruised big toe. No lost time. No compensation.

LEHIGH *Lockrim** **STEEL TOE BOX**

RR LOCOMOTIVE caught this shoe against a box-car coupling while brakeman was trying to kick coupler into position. It might have sheared his foot off. Toes and instep were only badly bruised.

TODAY ... CATALOG SHOWING 43 DIFFERENT STYLES OF SAFETY BOOTS AND SHOES

3000 LB. TRACTOR ran squarely over the toe of this one. Note how toe box was partially flattened, but Lockrim held fast. Injury: one bruised big toe.

650 LB. STEEL BILLET fell 4½ feet striking just over large toe. That's 2925 ft. lbs. weight-at-impact. A few minutes time out for examination and employee returned to his job. No injury.

*TM Reg.

It's Safe to Say

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★ RED OR BLACK

DESPITE the wailings of professional pessimists, the past year did not bring about the crack of doom. We managed to muddle through the year with a standard of living matched by no other country in the world. Sammy is still regarded by all other nations as the rich uncle whose pockets represent a bottomless pit and, fallacious as that view may be, we still are doing all right by contrast.

Surveys made at the start of the new year give promise of continued relative prosperity for 1950. Certainly industry and finance have good cause for maintaining a hopeful attitude as the demand for consumer services and products, heavy and light, will remain high.

The international scene, it is agreed, will not become too black even though here and there a dimming prospect may appear. Obviously, the peoples of the world have had their fill of strife and it would require heavy selling on the part of political leaders to whip up their nationals to outright belligerence. All in all, therefore, a note of optimism is not entirely out of order as we enter 1950.

Of special interest to the safety field is the wider acceptance that national as well as individual prosperity depends to a great degree upon accident prevention. No economically sound system of compensation or insurance payments yet devised can replace the earning power of man. And in these days of burdensome taxes and high living costs, this earning power must not be jeopardized by accidents.

Time was when the crusade for accident prevention was based upon the humanitarian appeal. In the past, an attempt was made to sell safety by depicting grim views of the crepe-bedecked widow, the empty chair and the tear-filled eyes of bedraggled orphans. Now, however, we need not be charged with sordid or crass commercialism in emphasizing that accidents cost money. True, the human suffering is incalculable but the financial loss inflicted usually upon those least equipped to bear it is a burden that we can not only calculate very easily but do much more to prevent. It is that loss which is reflected in every policy we buy and in every commodity we purchase.

★ ★ ★

Fortunately, accident prevention is a non-controversial subject. Management, labor and union officials are in full agreement on this one topic at least. Wages and hours may be open to debate but the factor of working conditions—which certainly includes safety—inspires complete unanimity of approach.

We know that the first half of this century brought about complete revision of thinking along safety lines. No longer is an industrial accident viewed as an Act of Providence, unforeseen and inevitable. Safety leaders everywhere have given their lives and their hearts to proving the contrary and it is no longer a basis for argument.

Cost accountants working without sentiment are equipped to prove that safety effort can make the difference between red or black ink on company ledgers. It is our obligation therefore to show that the individual, as well as the corporation, is allergic to red ink resulting from accidents and industrial illness. The most paternalistic government on earth or the most generous compensation payments offer only a pitiful apology for the full-time wages of a safe worker.

★ ★ ★

During this month when annual propheeies are in fashion, it requires no crystal ball to see that accident prevention will make great strides in the second half of the century. Moreover, it requires no stretch of the imagination to predict that the time will come when an accident in industry will be viewed as a national disgrace. Progressive management now knows that preventable casualties are a heavy cost and eat into profits but it is our duty to imbue the individual employee with the doctrine that he has bet on the wrong color in choosing red instead of black.

Since the best safety device is the human body from the neck up, we already have the perfect safety tool if we will use it constantly for individual and national prosperity.

H. A.

EYE SAFETY

is a TWO-IN-ONE program

No eye safety program is complete unless it is built on the basis of *protection plus correction. Protection* against the many hazards which can cause costly eye accidents. *Correction,* professionally-prescribed, for the 50% of workers whose vision needs refractive help if they are to see clearly . . . or safely. Call on your Bausch & Lomb distributor for prompt prescription service on industrial eyewear. Your safety record and your production record will improve.

Write for a copy of the new Bausch & Lomb catalog on industrial eyewear. It includes a highly informative discussion of the theory and design of protective industrial eyewear. It also describes the complete line of Bausch & Lomb Occupational Eyewear, the eyewear built to the highest quality standards. Bausch & Lomb Optical Co., 693-M St. Paul St., Rochester 2, N. Y.

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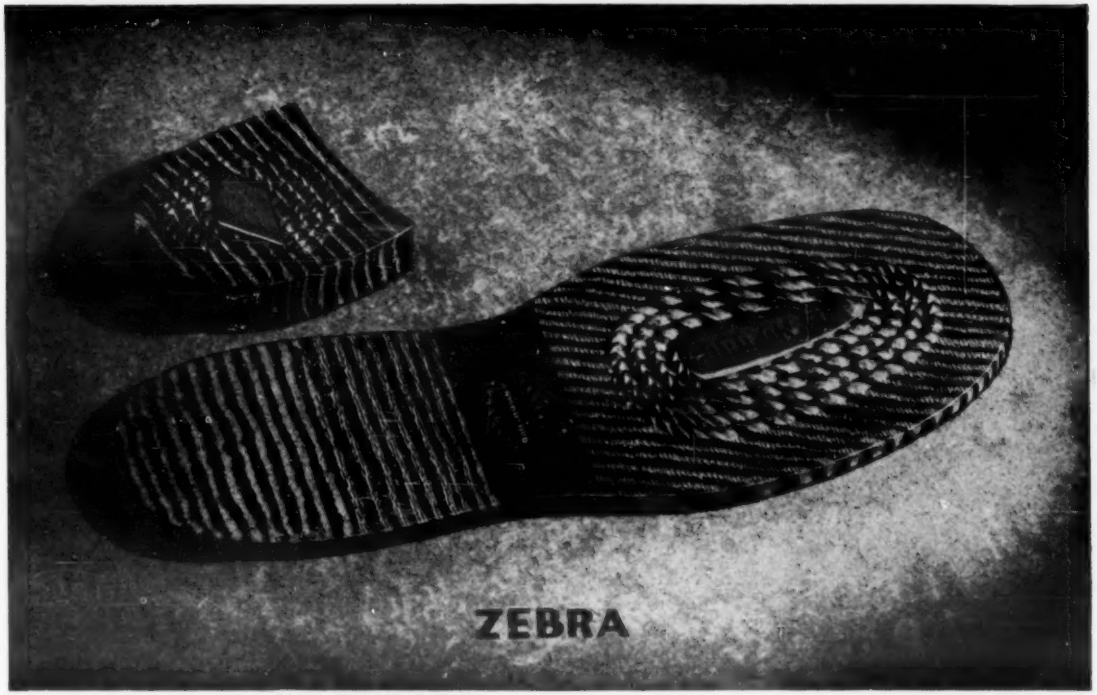

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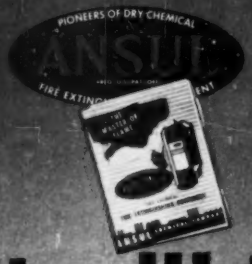
Send for File No. 504 You will receive a variety of helpful printed matter. Included is our latest catalog which describes Ansul Extinguishers of all sizes — from the small Ansul Model 4 to Ansul Piped Systems and Ansul 2000 lb. Stationary Units.



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THE *Finnell* DRY SCRUBBER CLEANS FASTER... More Thoroughly

A unique combination of labor-saving features is responsible for the greater speed and thoroughness with which the *Finnell* Dry Scrubber cleans grease-caked floors.

Equipped with two powerful scarifying brushes, this *Finnell* digs through and quickly loosens the most stubborn coatings of dirt, oil, grease, and shavings—as the special couplings adjust brushes to floor irregularities, to get into indentations and grooves that rigid coupling brushes would pass over and miss.

To re-sharpen the brushes of the *Finnell* Dry Scrubber, simply *flip the switch.* That reverses the motion of the brushes and re-sharpens them *automatically* . . . while working. Eliminates the need for frequent changing of brushes by hand in order to maintain a good cutting edge.

Low construction makes it easy to clean around and beneath equipment, and the adjustable handle adapts the machine to operator's height for most effective working position.

Various types and sizes of wire scarifying brushes are interchangeable in the brush rings of this *Finnell* and, with other brush rings, the machine can be used for wet scrubbing, steel-wooling, waxing, and polishing. Ruggedly constructed. Has heavy duty G. E. Motor, oversize Timken Roller Bearings, special bronze worm gears, leak-proof gear case.

For consultation, demonstration, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 4101 East St., Elkhart, Ind. Branch Offices in all principal cities of the United States and Canada.

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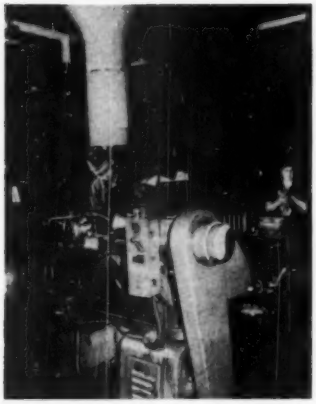


Color contrast painting is a means of drawing attention to moving parts on machines. Protective measures such as this one in a General Motors plant help make employees conscious of potential hazards. Each operation at a plant has written safety procedures, and safety apparel is worn.

SIX PRINCIPLES OF SAFETY AT GENERAL MOTORS

Employees are urged to submit ideas for improving safe plant operation. One such suggestion—a safety guard on machines used to fabricate engine bearings—earned its inventor, Wesley Barfoot, a $1,000 savings bond. Here, Mr. Barfoot, a machine repairman, points to his invention.

By DAVID T. MOULD,
Safety Director, General Motors Corporation

GM has been spending an average of $10,000,000 annually on its accident prevention and health program. But the expenditure of money itself will not bring about safe conditions. From top executives down through foremen, GM has brought to the worker on the lathe, the milling machine, the sub-assembly line and the final assembly line an acute consciousness of doing jobs safely.

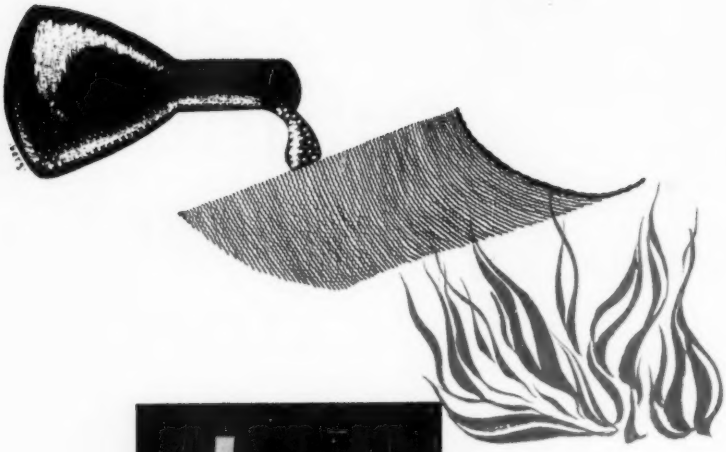
ALTHOUGH the problems encountered in promoting a safety program in a corporation whose operations are decentralized such as those of General Motors are many and varied as compared to a centralized organization, the basic principles upon which the solution to these problems rest are fundamentally the same. The one most important factor which has made our program successful has been the wholehearted, active, energetic support of top management in establishing definite safety policies and procedures for the individual plants.

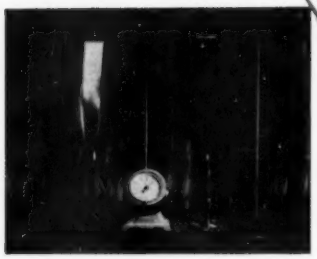
Industry as a whole can be justly proud of the part they played in preventing accidents during the last several years. In many cases plants established new safety procedures with extensive safety training programs for employees before they were permitted to start working. There is no doubt that these training programs played a very important part in the success of the accident prevention program and should be continued in the future.

Wearing of safety glasses has "paid off" many times in General Motors plants. A worker glad that his eyes were protected by safety lenses is James Gilson of the Oldsmobile assembly plant in Lansing, Mich. Mr. Gilson was prying a damaged letter "S" from a hood when the letter broke loose and struck his glasses.

Most of the subjects with which we have to deal in our industrial operations are tangible things, such as buildings, equipment, materials, processing, schedules and other things which have to do with our industrial work. Most of these things are matters to which we can assign some physical measure. But the all-important subject of safety, which concerns all of us vitally, is one of the intangible things. Unfortunately, the measure which we apply to safety is the measure of accidents. It is a measure based upon an after-the-fact record. Needless to say, we all try to keep that record as low as possible. But safety means safety of *(Continued page 45)*

COTTON





Laboratory test showing comparison between plain canvas at left and a sample of the same type of canvas treated for fire resistance at the right.

Fire-resistant finishes can be applied to textiles for use as welding curtains, protective clothing, tarpaulins, awnings, etc. What types of finishes are available? How can they be applied? What recent improvements have been made in flame-proofing?

IN THE past few years a number of disastrous fires which resulted in considerable loss of life, focused attention on the problem of rendering textiles flame resistant, particularly when used in places of public assembly such as circus tents, hotels, etc. Various state and municipal regulations have already been enacted which emphasize the importance of preventive action. The manufacturers of cotton textiles have been cognizant of the situation for some time and in recent years significant developments have been made in the field of fire resistant finishes or coatings to meet the public need.

It is extremely important in estimating the protective value of these various finishes to define the various types. In general there are two classifications of fire resistant finishes for textiles. First, the water soluble or indoor type; and second, the weather resistant or outdoor type. In each of these groups, there are several different chemical combinations put on the market by various manufacturers. None of these finishes will render a fabric strictly noncombustible. Many of these treatments however will do an excellent job of making cotton fabrics fire resistant and flame repellent. That is, they will prevent the propagation of combustion.

Water Soluble Treatments

The water soluble treatments definitely have their place in the field of fire prevention as far as indoor fabrics are concerned. There are many chemicals readily available and widely used for treating indoor fabrics such as curtains, drapes, etc. These treatments are relatively inexpensive and have the

FABRICS NEED NOT BURN

By MORRIS D. VAN PATTEN, William E. Hooper & Sons Co., Philadelphia, Pa.

advantage of not changing the "hand" or "feel" of the fabric. In general, however, since they are all water soluble the fabrics must be retreated periodically as the moisture present in the atmosphere will over a period of time destroy their effectiveness.

Permanent Fire Resistant Treatment

For all outdoor uses the weather resistant or permanent type of finish is the proper thing to use. The factors governing such a choice are first, that a water soluble finish would wash out of the cloth in the rain. Second, a weather resistant finish is pigmented and designed to withstand exposure to sunlight which is likely to cause chemical breakdown or loss of tensile strength in other types of finishes. Third, mildew is generally a factor in the deterioration of fabrics used out of doors and the better weather rsistant finishes are also mildew resistant. A further consideration in the selection of a permanent fire resistant finish is that it should not, in any way, deteriorate or reduce the tensile strength of the fabric on which it is applied.

Other Finishes

In addition to the two general classifications mentioned above, there are available two or three fire resistant treatments which, strictly speaking, do not fall into either of the above classifications. They have the advantage of the indoor type of treatment in that they do not affect the "hand" or "feel" of the fabric to which they are applied and they also are to a degree weather resistant. They do not however stand up against outdoor weathering as successfully as some of the best of the permanent weather resistant treatments.

Testing Agencies and Government Specifications

For the protection of the public several testing laboratories including Underwriters' Laboratories, Inc., and Factory Mutual Laboratories have given their stamp of approval to the products of various recognized finishers. Further, Federal Specification CCC-D-746, Army Specification 6-345 and Navy Specification 24-C-20 have been set up as a guide to assist the purchaser in acquiring the proper finish for his particular use. The American Society of Testing Materials and The American Association of Textile Chemists and Colorists are concerned with proper testing methods. Also the Bureau of Standards, Washington, D. C., have conducted extensive laboratory tests on all recognized fire resistant treatments and can furnish impartial analysis of these finishes upon request.

Methods of Application

There are two general methods of application for fire resistant treatments for textile materials. One is field application by brush, spray or dip methods. The second is factory application by finishing machinery. The choice of application may be determined by the size of the job, time limit, availability, etc. If, for example, a manufacturer has welding curtains which have never been treated, it is entirely practical to treat them right in his own plant with a fire resistant finish. On the other hand, if the purchaser wishes to acquire new welding curtains or other items resistant to flame, it would undoubtedly be more economical to specify factory processed fabrics. Obviously the factory processing can be more carefully controlled through laboratory facilities and expert supervision.

Field Application

As most of the weather resistant types of compound are thinned with a combustible solvent, it is most important that precautions be taken to do the treating in a well ventilated area and to prohibit smoking and other fire hazards in the vicinity of the work until the fabric is thoroughly dry. This may sound paradoxical but the chemicals used in the weather resistant type of *(To page 51)*

FEATURE

This is the fourth of four feature articles on Fire Protection. The first three articles, dealing with extinguishers, extinguishing systems, and storage cans, appeared respectively in the October, November and December 1949 issues of SAFETY ENGINEERING.

HOW TO SHIP

By GEORGE W. BENBURY, Manager Packaging & Labeling Dept.

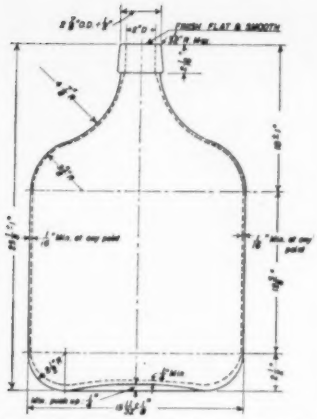


Fig. 1. Specifications for 13-gallon carboy bottle.

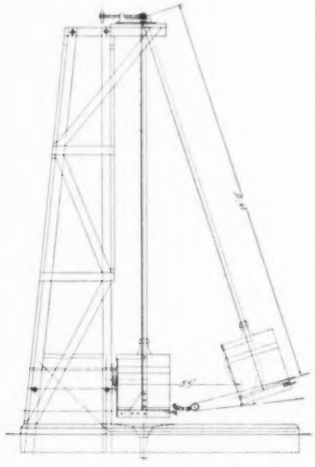


Fig. 1A. Machine for testing carboy strength.

IN THIS age of chemistry more and more industrial plants today are concerned in one way or another with the storage, handling or processing of chemical products. In many fields new and specialized chemical materials are being developed to speed up processes or to improve quality of finished products which may be metal, glass, plastic, fiber, or one of numerous other materials not necessarily directly associated with the chemical industry. Because of this ever widening use of chemicals and of the increasing number of new chemical products available for meeting the special requirements of industry, it becomes highly important for those who may be employing these materials to be aware of the basic design of chemical shipping containers employed today, as well as of the means by which the chemical industry promotes the development and dissemination of uniform, helpful information on the safe handling of its products.

Container Design

While in many industrial plants the storage, handling and processing of hazardous chemicals is largely a matter of routine, the containers in which these commodities are shipped generally are accepted by industrial consumers without question, because for a large part they provide the safety for which they were designed. It is significant, and should be of interest, that specifications covering design of those containers are for the purpose of insuring safety in transportation. Any advantage to consumers is incidental, at least in principle. However that may be, real protection is provided the user of hazardous chemicals through the Regulations of the Interstate Commerce Commission, and for that reason it would be well to have some basic knowledge of how this is accomplished.

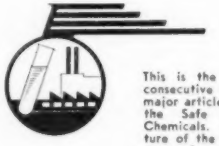
Officially known as Interstate Commerce Commission Regulations for the Transportation of Explosives and Other Dangerous Articles, the purpose of the regulations is summed up in Section 10, worded as follows:

10. PURPOSE OF THE REGULATIONS

(a) To promote the uniform enforcement of law and to minimize the dangers to life and property incident to the transportation of explosives and other dangerous articles by common carriers engaged in interstate or foreign commerce, these regulations are prescribed to define these articles for transportation purposes, to state the precautions that must be observed by the shipper in preparing them for shipment by rail freight, rail express, rail baggage, highway, or by carrier by water. It is the duty of each such shipper to make the prescribed regulations effective and to thoroughly instruct employees in relation thereof.

(b) Explosives and other dangerous articles may be offered to carriers for transportation provided the articles are in proper condition for transportation, are as defined, and are packed, marked, labeled, described, certified, and otherwise as provided for herein for acceptable articles for transportation by rail freight, rail express, rail baggage, highway, or water. Articles must be loaded and stayed according to regulations herein applying to carriers by rail. Methods of manufacture, packing, and stor-

FEATURE



This is the second of a consecutive series of three major articles dealing with the Safe Handling of Chemicals. The next feature of the series will appear in the February 1950 issue of SAFETY ENGINEERING.

CHEMICALS SAFELY

Pennsylvania Salt Manufacturing Co.

What are the I.C.C. requirements for containers? How to protect personnel against chemicals

age, in so far as they affect safety in transportation, must be open to inspection by a duly authorized representative of the initial carrier or of the Bureau of Explosives. Shipments that do not comply with these regulations must not be offered for transportation.

Besides explosives, five general classes of dangerous articles are defined. These are flammables, oxidizing materials, corrosive liquids, poisons, and compressed gases. Specific types of containers are authorized for the transportation of each commodity under the above classifications, container specifications being dependent upon related hazards and the chemical and physical properties of each material and involving not only detailed construction requirements but for final proof of acceptance, a performance test to certify assurance of strength, workmanship and ability to withstand handling normally expected to be encountered in transportation.

Furthermore, through the services of the Bureau of Explosives all proposals for new or revised container specifications are carefully studied before approval may be obtained for them to be placed into service even on an experimental basis. The Bureau also investigates reports of transportation accidents involving shipments of dangerous articles, for the purpose of insuring that inefficient containers not be continued in service.

The Manufacturing Chemists' Association, through its several technical committees, also assists in developing information relating to adequacy of package design for new chemical products when the need arises. On the other occasions through cooperative effort with container manufacturers, new containers may be sponsored after thorough tests are made in accordance with requirements of the Bureau of Explosives.

While the Regulations are voluminous, providing many detailed requirements for shippers, the specifications relating to containers are of primary interest insofar as consumers are concerned since largely through those specifications the containers are made to reach their destination in safe condition, thus providing better assurance that materials shipped in them may be later stored and handled with less hazard. Other than compressed gas cylinders and bulk containers, specifications in force currently are about 85 in number.

In order to better illustrate the inherent safety made possible through uniform specifications and its benefit to dangerous chemicals consumers, a brief review is covered below of the specification highlights of a few I.C.C.—authorized containers in common use today. These are not intended to be complete and therefore do not fully describe all requirements which must be met. It should be carefully noted that in each instance two basic considerations are involved: (a) the package must be manufactured according to certain minimum standards, and (b) when completed, it must successfully withstand performance tests as certification of acceptability.

Boxed Carboy—I.C.C.-1A

This type container is one of the oldest approved by *(To page 36)*

Fig. 2. Welded steel drum of 55-gallon capacity.

Fig. 3. Steel drum for single trip service.

By DAVID L. GARRISON
J. H. Emerson Company, Cambridge, Mass.

Bring 'em Back to Life

What to do in asphyxial emergencies
What are the advantages of resuscitators?
Some manual methods (pros and cons)

THE first-aider's first concern is the breath of life. Broken bones or even hemorrhage yield priority to breathing, for unless a supply of oxygen is continually reaching key points in the body, life ceases to exist.

In asphyxial accidents the problem is to get oxygen to the heart muscle and to the breathing center in the brain. It is a triple problem: ventilation of the lungs, circulation, and warmth (so that chemical transfer to the tissues will be adequately rapid).

Speed in starting resuscitation is of the utmost importance. When breathing stops, the heart fails so rapidly that life-saving measures may be unavailing unless begun within four or five minutes. During the first few seconds after respiratory failure very simple aids may be adequate. Just a single deep breath will sometimes turn the tide. If the patient remains very long, however, without adequate oxygen, the problem becomes more difficult. In an effort to save these difficult cases, oxygen inhalation has been widely employed, and recently mechanical resuscitators have proved themselves extremely valuable.

It should be pointed out that resuscitators are not always available for first aid, but are more often "second aid." In hospital maternity wards they are generally ready for instant use. Some well-equipped beaches maintain resuscitators close to the water's edge, and often police or fire rescue squads called to household gas accidents have their resuscitators in hand. But in most non-hospital cases it is necessary to begin artificial respiration by a manual method at the earliest moment the victim can be reached. When a resuscitator arrives and is ready, it then takes over without the loss of a breath.

Manual artificial respiration has two great advantages: It can be started without a moment's delay. Any individual can apply it, since no equipment is required.

Advantages of Resuscitators

Modern resuscitators have the following advantages: They give better ventilation than manual methods. They provide oxygen while doing so. They involve no bodily pressure, and hence are safe for persons with broken ribs or backs, severe burns, or pregnancy. In addition, the types which operate

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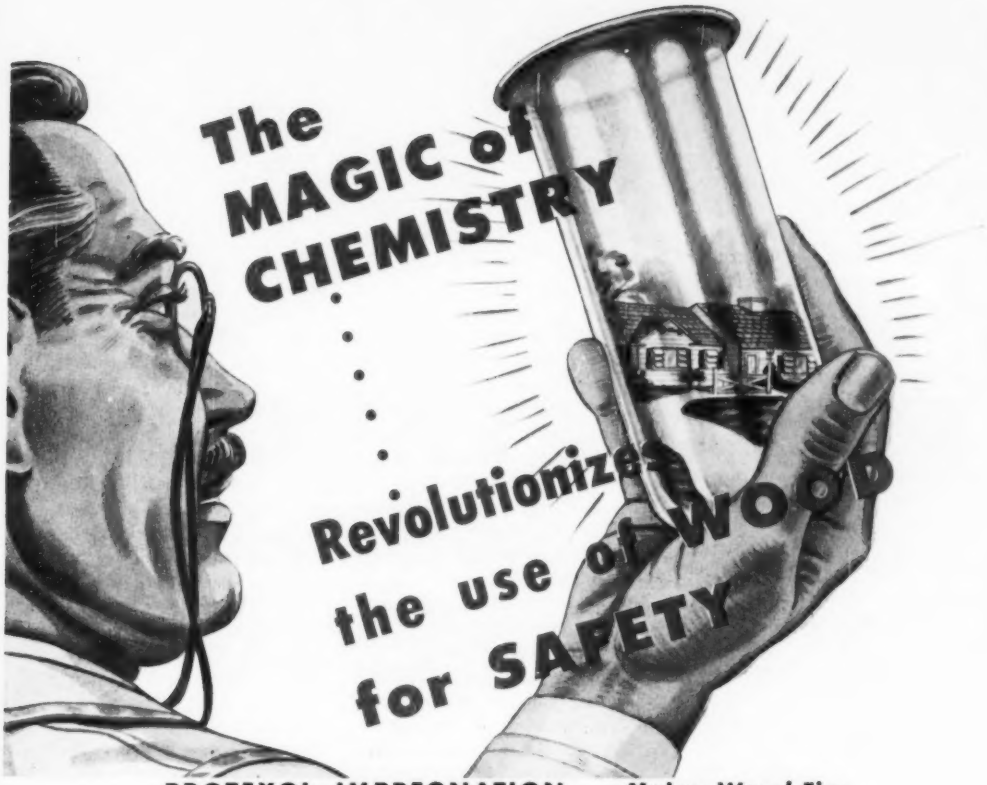
FEATURE

This is the first of three feature articles concerned with First Aid. The next two articles of the series will be published in the February and March issues of SAFETY ENGINEERING.



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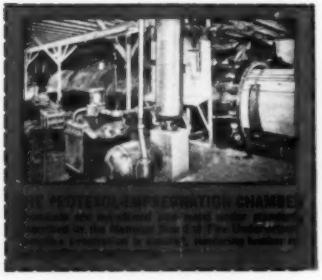

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from extension hoses can bring the breath of life to victims trapped in inaccessible places as, for instance, under an overturned vehicle.

The automatic positive-and-negative types have further important features. First and foremost, they aid circulation. Second, they warn with a rapid clicking if the throat is blocked, and provide an aspirator to clear out obstructing fluids.

Clear throat passages are essential for artificial respiration by any method. Difficulty may arise from mucus or fluids collecting in the throat, occasionally from half-swallowed objects such as false teeth, or often merely because the head is in a position which allows the tongue to fall back and block the throat. Neither artificial nor spontaneous respiration is possible, until the rescuer realizes there is an obstruction and corrects the difficulty. The resuscitator's unique obstruction signal, therefore, is a valuable time-saver.

Practically all modern resuscitators are adjustable for use as straight inhalators, as the patient revives and begins to breath spontaneously.

Pressures

The pressures used in resuscitators are important. The common automatic type is set at 14 millimeters of mercury positive pressure alternating with 9 millimeters of mercury negative. These pressures were approved by the American Medical Association more than a decade ago, after pioneer research by Dr. Coryllos had convinced the Association's Council on Physical Therapy that they were safe in doctors' or in laymen's hands. Since then no instance of lung injury has been known to occur from such pressures, though thousands of resuscitators are in daily service, more than half of them in non-medical hands.

It is interesting that pressures used for adults are equally safe for new-born babies (because of the smaller air-passages). For either adults or infants a great safety factor, in the automatic types, is that peak pressures are only momentary and cannot be maintained. Even moderate pressures would be undesirable if held continuously.

Greater pressures than plus 14 and minus 9 might on rare occasions be helpful in speeding ventilation. Far more often, however, they would do harm by hyperventilation, "washing out" carbon dioxide from the body too rapidly.

Carbon dioxide, normally found in the blood in small quantities, is well-known as a stimulant to the breathing center of the brain. It accumulates rapidly, however, if breathing stops, and in excessive quantities reverses its effect and severely depresses respiration. For this reason physiologists nowadays recommend pure oxygen for use in resuscitators, rather than mixtures containing CO_2. (Monoxide poisoning is generally considered an exception.) It is possible that the swing of the pendulum has gone too far. Some evidence exists that hyperventilation occurs, even from standard pressures, in long-continued resuscitation. If so, the use of CO_2 mixtures, following pure oxygen treatment, might be indicated.

Pressures much lower than the standard 14 and 9 would give less adequate ventilation in emergencies, and there seems to be no reason for them in positive-and-negative resuscitators. In resuscitators which lack a negative phase, lower pressures have to be accepted, when treating patients with poor circulation.

Effects on Circulation

The effects on the circulation of various types of resuscitation are extremely important. Research by eminent physiologists recently has shown that automatic positive-and-negative resuscitators aid circulation, whereas types that give only positive pressure tend to decrease it.* The negative phase of a resuscitator helps the heart to fill. Positive pressure within the chest has the opposite effect and impedes the return of blood to the right side of the heart. Lack of filling, of course, results in a corresponding decrease of output. This decrease may not be important if the heart is strong and the blood vessels resilient. But for a patient in shock or advanced asphyxia such a strain on the cir-

(Continued on page 52)

* Motley *et al.* in Army Air Force Memorandum Report No. TSEAA-696-79-F mention (on page 71) a decrease of 39% in one instance. See also Tables 5 and 7 (pages 377, 378) in the *Journal of the American Medical Association*, Vol. 137, May 22, 1948.

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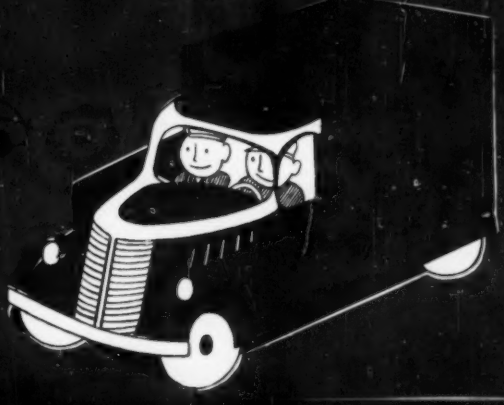


New Safety Code for Rubber Mills and Calenders

By ERNEST W. BECK, Supervisor of Safety,
United States Rubber Company, New York, N. Y.

The newly revised code for rubber mills and calenders issued by the American Standards Association, Inc. has some important changes for protecting workers.

THE revised Safety Code for Rubber Mills and Calenders, B-28.1, has been completed and recently the American Standards Association had the first edition printed. It is now ready for distribution. The rubber industry believes there is no other industrial code in existence at the present time that is quite like the Safety Code for Rubber Mills and Calenders, in that this code specifies in inches and fractions of inches, the required stopping distances of industrial production equipment when traveling at certain rates of speed. With the possible exception of the Elevator Code, the writer knows of no other industrial code that specifies within a certain number of inches required stopping distances for machinery.

To give the history of the Safety Code for Rubber Mills and Calenders, it is necessary to go back 25 years. In 1924, the International Association of Industrial Accident Boards and Commissions and the National Safety Council Rubber Section sponsored a code that later became known as "Safety Code for Rubber Mills and Calenders," published by the United States Bureau of Labor Statistics, Bulletin No. 447. This code was printed as a "Recommended American Practice." It was approved in March, 1927, by the American Engineering Standards Committee and was printed by the United States Government Printing Office in June 1927. The New Jersey Department of Labor took an active interest in developing this code. The code served a useful purpose but to my knowledge was never officially adopted as such by any state as a state code. The code, however, did serve as a guide to state and other supervising authorities and was used by the rubber manufacturing industry operating mill and calender machines. It was also used by the concerns manufacturing rubber working machinery.

In 1940, a new committee was formed under the same sponsorship to revise this code under the procedure of the American Standards Association. An organization meeting was called in Chicago on October 9, 1940.

Later, in 1941, a meeting took place in New York at the offices of the United States Rubber Company to consider the revision of this Safety Code. At this meeting it developed that another code committee was in receipt of a very strong communication from the National Defense Personnel of the Federal Government to the effect that 1941 was not the time for unnecessary changes and expenditures, and that such time and money be devoted to the National Defense. In line with this communication, the committee agreed to defer the work on the revision of the Safety Code for Rubber Mills and Calenders until the end of World War II.

At the close of the war a code committee meeting was held June 26, 1947, in New York.

The chairman of each sub-committee had the privilege of appointing his own committee, and the membership of the sub-committee was not limited to members of the general committee. Members of the sub-committee could appoint members from outside the membership of the general committee. However, the outside members were not to have a vote in the meeting of the general committee. The feeling of the committee was that its object should be to draw up codes covering the major hazards in the industry, such as, mills and calenders and possibly vulcanizers. It was decided to leave the plastic and cork industries entirely out of the code and confine the code to the rubber industry only.

Changes in the Code

Many changes have been incorporated in the revised code. The most important change has been made in connection with the stopping limits for mills and calenders.

A committee of electrical engineering experts using data obtained from thousands of test stops made under operating conditions in many plants throughout the country developed a new set of stopping limits and a new method of computing these limits. These new limits recognize the advances made in developing new and better *(To page 34)*

FEATURE

LOOK

By NORMAN H. DAVIS, JR.,
Assistant Secretary,
Underwriters' Laboratories, Inc.

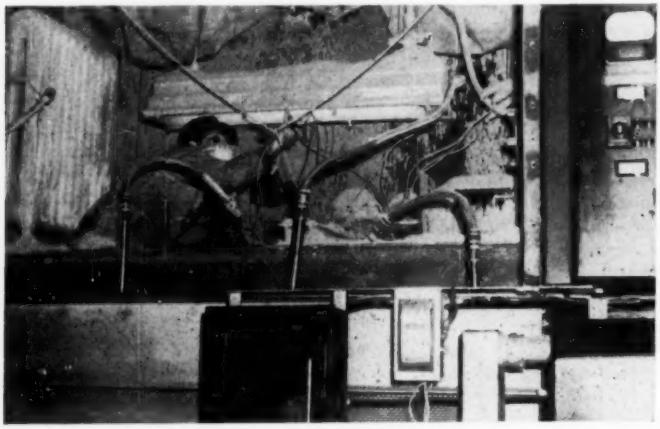
This is the third of three feature articles on Electrical Equipment. The first two articles of the series, dealing with emergency lighting and approved equipment, appeared respectively in the November and December 1949 issues of SAFETY ENGINERING.

—RIGHT—
The safety glass cracks but the picture tube remains intact. In television tubes, relatively high vacuum is necessary and mechanical damage of the tube proper produces what is called an implosion. The first effect is that of atmospheric pressure forcing pieces and splinters of glass inward, ultimately resulting in pieces of glass passing beyond the dimensions of the tube. To prevent accidental breakage of the tube and to confine particles within the set, U.L. insists that a safety glass be provided on the set.

WE HAVE Thomas A. Edison, George Westinghouse and many other noted scientists to thank for providing what is known as man's greatest servant—electricity. In fact, electricity has become so common today that many of us wonder how our grandparents existed before its development. Electricity is recognized as man's greatest servant, but if not properly used, it may become one of man's greatest enemies.

Take, for example, the ordinary type of television set. We sit back in an easy chair, relaxed, watching a football game, wrestling match, Metropolitan Opera, or one of many other interesting shows without giving any thought to its operation or possible hazards.

The television receiver's first and potentially most serious hazard is electric shock. It is recognized that any radio set operated from household current uses or generates voltages which, under certain conditions, may cause serious or fatal shock. Accidents of this sort are not in fact peculiar to radio or television, but can result from almost any electrical appliance. Television reception, however, requires the generation and use of voltages far higher than needed for conventional radios. Voltages up to thirty thousand may be used in video equipment, although in the average video home receiver, the voltage is probably only about ⅓ that figure and in the small table models, it is around three thousand to five thousand volts. Equipment presently being sold to the public is for the most part provided with interlocks on the access panel to prevent persons from coming in contact



A dust-tight lighting fixture for hazardous locations has been subjected to ten-day test. With temperatures of the fixture recorded by means of thermocouples, the fixture must not overheat to cause ignition of collected dust. After cleaning, the fixture is disassembled to determine its dust-tightness.

Engineers at Underwriters' Laboratories, Inc. test washing machines under actual conditions of operation. In addition, wringers for washing machines are tested to minimize the damage that may be done when someone gets caught in the rollers. They measure the force necessary to release the rollers under maximum pressure conditions. Releases must operate with a force of not more than 20 pounds; after tripping, the rollers must separate at least 2 inches, and when released no parts thrown about.

FOR THE APPROVAL LABEL

If the electrical equipment that you buy does not have the approval label of a testing organization, you may be getting more than you bargained for: fire, explosion, personal injury.

with a high-voltage point while it is energized.

At the same time, persons repairing or servicing the equipment will have occasion to circumvent the interlocks, exposing themselves to the energized circuits. For this reason, only thoroughly qualified persons should undertake repair of television sets.

Implosion Hazards

Since cathode ray (picture) tubes are relatively large and operated at high vacuum, another hazard, implosion, is introduced. This is an inward rupture of the tube, with flying glass as the highly probable result. The possibility of implosion (and the degree of violence of the rupture) increases with the size of the tube. Since the wall thickness in some of the larger tubes is as much as three quarters of an inch, it can be easily understood that the possibility of serious injury from pieces of flying glass is also increased.

In a sharp implosion, the force of the external air impels the glass into the tube and out the other side. For this reason substantial protection of the tube on all sides is advised. The tube face should be screened with shatterproof glass, or its equivalent, and all enclosures should be in place when the set is in operation.

Safeguarding the Public

All television sets listed by Underwriters' Laboratories, Inc. are provided with this shatterproof glass or the equivalent. The top, back, sides and front of the enclosure of a picture tube having a maximum diameter of 6 in. or more, including the transparent protective covering over the face of a directly viewed picture tube, shall be capable of withstanding a single impact of five foot pounds from a solid, smooth, steel sphere 2 inches in diameter and weighing approximately 1.18 pounds, without developing openings larger than would permit particles of the picture tube to emerge from the set.

This test is merely one of the many ingenious tests especially designed by the technicians of Underwriters' Laboratories, Inc. to carry out various tests on a wide variety of products. Although the electrical Department of Underwriters' Laboratories, Inc., by its very nature, devotes most of its effort to the prevention of electrical fires and shock, through its testing and examination of equipment, such effort would be lost if the manufacturers did not co-operate by having their designs incorporate features designed to reduce the hazard, if electrical inspectors and others charged with safeguarding the public did not properly supervise the installation of electrical equipment, and if public utilities did not co-operate by seeing that their services are rendered only to installations made reasonably safe, both by the types of equipment furnished and the proper installation of such equipment.

Products and materials which pass the test may then carry the words "Underwriters' Laboratories, Inc. Inspected," or the initials "UL" on the tag or name plate.

Underwriters' Laboratories, Inc. was started in 1894 and supported for many years by the nation's capital stock fire insurance business, but is now a nonprofit, self-supporting organization.

Sometimes manufacturers bring in early designs of a device to discover just what needs to be done to make it safe and to obtain the Underwriters' Laboratories, Inc.'s listing. Nearly half of the products tested fail to measure up to the high standards the first time. Many of these are then improved by the manufacturer until considered safe by the engineers. More than 400,000 products have been found acceptable for listing.

Home Appliances

One might ask, "Do the Underwriters' Laboratories tests on electric ranges stop with the switch? Is there anything about an electric range that will burn?" The floor, walls, and adjoining wood cabinet may very easily burn if the range has not been properly constructed.

For testing, engineers at Underwriters' Laboratories, Inc. install the range in accordance with the manufacturer's recommendations.

Thermocouples and thermometers are placed on the walls, floor, cabinet and within the range. Then the oven and surface unit switches are turned to "high" for 15 minutes followed by continuous operation at a fast cooking heat for hours. If any of the temperatures exceed combustible limits, the range will not be approved. Immediately after this test, the engineers apply 900 volts between the current-carrying parts and the enclosure to be sure an electric shock hazard will not de-

velop. When "approved," the model number of the range together with the manufacturer's name is included in the "List of Inspected Electrical Equipment" published by Underwriters' Laboratories, Inc. This List is available for the asking. The range may also bear the letters "UL" enclosed in a circle.

Washing machines are another common household appliance which, if not properly constructed, may cause a serious shock hazard as well as a fire hazard and possibly a casualty hazard. The Laboratories' technicians check the temperatures on the motor of the washing machine while operating it through a normal sequence of washing, rinsing, and wringing. In addition they are subjected to a dielectric strength test, as in the case of the ranges, to determine that a shock hazard will not develop during the normal course of its use. Furthermore, if it is of the wringer type, they check the wringer to make sure that the safety release will "release" properly without undue force, and will not throw the rollers out of the mechanism as well as stopping the rollers from turning.

Industrial Equipment

Now let us consider the type of electrical equipment which is not normally found around the home —electrical equipment for hazardous locations.

In the days before the development and commercial introduction of explosion-proof and dust-tight electrical equipment for use in hazardous locations, the inspection authorities and the insurance Underwriters' restricted the use of electrical motors and other equipment having arcing or sparking contacts. Safety considerations prohibited the use of such equipment in hazardous areas. The laws of many states required the segregation of electrical apparatus in non-hazardous locations.

The demand for explosion-proof and dust-tight electrical equipment increased rapidly with the growing use of electrical power and with the introduction of new manufacturing processes that released flammable gases and vapors, or combustible dusts, into the air.

What Is a Hazardous Location?

Concurrent with the development of equipment for safe use in hazardous areas, it was of increasing importance to define "hazardous locations" more clearly. This function was fulfilled by the National Electrical Code, Article 500 which defines hazardous locations as follows:

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class II locations are those which are hazardous because of the presence of combustible dust.

The term "explosion-proof" indicates that such equipment has an enclosure that withstands internal explosions of gas- or vapor-air mixtures. In other words, the explosions will be confined without bursting the enclosure or loosening the joints, and propagation of flames will be arrested by the close fitting, metal-to-metal joints that have sufficient overlap to cool the hot gases that vent to the outside. The enclosure must have these characteristics because it is practically impossible to prevent the entrance of explosive vapors. Actual tests have shown that the gases and vapors enter the enclosure even under normal changes of temperature. Hence, the term vapor-proof is misleading when used with reference to motors, lighting fixtures and other equipment intended for use in Class I hazardous locations.

Explosion-proof devices also must be designed to operate under full load conditions without developing temperatures above the ignition temperature of the flammable gas or vapor in which they are intended to be used. Compliance with the construction requirements is a prerequisite to the listing of explosion-proof equipments that are submitted to Underwriters' Laboratories, Inc.

It is apparent that the type of wiring used in Class I locations is of importance in order not to nullify the safety obtained by the use of explosion-proof equipment. For this reason, the National Electrical Code requires that rigid conduit with explosion-proof joints shall be employed as the wiring method. Joints in approved conduit made up with five full threads are recognized as explosion proof.

Explosive Dust Hazards

The testing of equipment for use in Class II hazardous locations presents a somewhat different problem because, as previously explained, apparatus for use in dusty locations is designed to be dust-tight. It is not intended to resist internal explosions of dust-air mixtures. Obviously, if the dust is excluded, there will be no dust-air mixtures within the enclosure to become ignited. Accordingly, equipments for use in Class II hazardous locations are tested in specific dust-air mixtures in order to determine that the enclosures are dust-tight, and that overheating does not occur when the device is blanketed with dust.

Lightning Protection

Now let us consider another form of electrical hazard, lightning—nature's artillery—one of the greatest causes of farm fires. Each year, lightning destroys approximately 20,000,000 dollars worth of farm property in the United States, takes the lives of 500 people, and injures 1,300 others.

There is no method known for preventing the heavens from lashing down at us with those spontaneous, devastating releases of electrical energy, but there is a way we can protect ourselves.

Electricity prefers to travel over metal, particularly over copper or iron. On these the travelling is easy and no friction or heat is produced. If we build roads of copper or iron and run them from *(To page 32)*

A NEW FIRST by Cambridge

Rugged OIL-RESISTANCE plus Flexible Cushioning Comfort

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THE **Cambridge** RUBBER COMPANY

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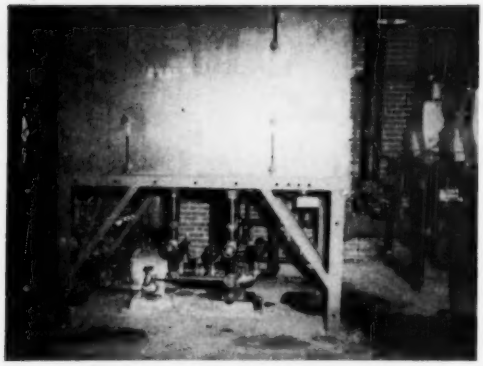
"BEAN



The foam-liquid storage tank and injection pump for a fixed piping extinguishing system. The mechanical foam smothers difficult liquid fires.

**By E. B. RUMBLE, Manager,
Special Hazards Division,
Automatic Sprinkler Corporation of America,
Youngstown, Ohio**

Man at left applies heat to System #1 at Schenectady Varnish Company. Discharge from test 18 hours before is almost gone without any clean-up.

The famous "bean soup" used by the armed forces to fight fires is now available for civilian purposes. Here is the story of one mechanical foam installation to protect highly flammable liquids.

FOR many years fire protection engineers have been using a chemically formed blanket of carbon dioxide bubbles as a medium for the extinguishment of fires in flammable liquid storage tanks and similar hazards. Yet, this chemical foam, although an excellent extinguishing agent, has been limited in its scope of protection because of the difficulty in adapting it to simplified system design.

Shortly before World War II, a new substance was developed which was considerably more adaptable than chemical foam. The formation of foam by this new method was radically different from chemical foam in that it consisted of a mass of mechanically formed air bubbles in place of chemically formed CO_2 bubbles. The advantages in the handling and usage of this material were apparent to the military arm of our country who used practically the entire U. S. output during the hostilities. Huge quantities of the material were used by the Navy where it became popularly known as "bean soup."

Of the several materials used to produce mechanical foam, the most popular and stable material is a hydrolyzed protein manufactured from a soya bean base. This material * when mixed six percent by volume with water and aerated forms a homogeneous tenacious foam blanket capable of flowing around obstacles and quickly extinguishing fires involving gasoline, benzol, naphtha and many other flammable liquids.

An excellent example of the use of this highly adaptable material in fire protection engineering is the installation recently completed and tested for the Schenectady Varnish Company, large manufacturers of synthetic resins and insulating varnish, at their Schenectady, New York facilities.

The basic problem at this plant was the control and isolation of a spill fire which might occur at tank car unloading locations and flammable liquid storage tanks on the 25 to 40 foot wide railroad spur located between the plant and the main line of a railroad. Materials as light as naphtha and benzol are stored and handled in this area which is practically inaccessible to city fire department operations.

The Schenectady Varnish Company, realizing the seriousness of the potential fire hazard to their plant from this unloading area and to the continuity of their operations, requested the engineering department of an insurance organization to study the problem with a view of making certain recommendations relative to protection. The progressive special hazards engineers of this group soon determined that standard methods of protection or relocation of the area alone would not be feasible, either from a production or economic point of view. They therefore suggested that a study be made of the adaptability and economic value of the use of mechanical foam for this occupancy.

Completion of this study indicated that positive protection could be obtained through the design of a mechanical foam system automatically controlled by means of Underwriters-approved rate-of-rise deluge sprinkler system valves, and the

* The commercial name of this product and the name of the manufacturer can be obtained on inquiry to the Editor.

SOUP" FOR FIRES

Mechanical foam is discharging through the fixed piping and nozzles in the test of System # 1, eighteen seconds after heat actuated the detector.

In two minutes, a blanket of mechanical foam has formed to smother the theoretical liquid-spill fire as the system continues to discharge.

Schenectady Varnish Company subsequently commissioned such a system.

Basic design study indicated that:

1. The mechanical-air-foam system should be automatic, because:
   a. Flammable liquid fires may cause failure of piping, fittings, valves, etc. within a very few minutes, thus adding additional volatile liquids to the original fire.
   b. Personnel on night duty at the plant were not located in the protected area.
2. The systems should establish immediate protection over that area which would be involved in fire.
3. The foam blanket should be such as to prevent flashback of fire for several hours.
4. The foam liquid should be available in adequate quantity so as to extinguish one fire with an equivalent reserve charge.
5. Adequate portable mop-up equipment should also be provided.

Using these basic points, a layout was designed, engineering data developed, and systems installed subject to Factory Insurance Association approval. Full scale operating tests were made on these systems for the use of all interested parties.

System Design

The area protected varies in width between 25 and 40 feet and is about 450 feet long. It is divided into three system areas. Protection for each area is regulated by means of one six-inch deluge valve, actuated pneumatically by pressure impulse from pneumatic heat detectors, which are strategically located throughout the areas protected by each system.

The mechanical functions of the system are based upon the integration of two operational units as follows:

1. Deluge sprinkler system operation employing the same type of deluge valve which has for many years been utilized for operation of water spray and deluge sprinkler systems for the protection against flash hazards, such as munitions manufacture, spray painting, aeroplane hangars and the like. The piping for this system is galvanized and hydraulically designed so as to provide a maximum efficiency of water usage. Each piping system is equipped with between 16 or 17 overhead foam aerating and discharge devices. The discharge pressure at these devices is about 75 PSI giving a total foam discharge of about 8800 GPM per system. These systems are equipped with alarm gongs, supervisory features and other types of devices required for approved sprinkler systems.

After three minutes of operation, the fire area has been completely covered by foam to a depth of about 7 inches. Foam dissipates in a few hours.

2. The foam storage and injection system consists of a small foam injection pump which takes suction from a double compartmented 800-gallon foam-liquid storage tank. It provides for the *(To page 43)*

TRANSPORTATION

Tire Chains for Safety

By HAROLD V. HOPKINS, JR.

WITH more motor vehicles on U. S. streets and highways than ever before, added emphasis is being placed on careful driving during the winter months.

Figures released by the National Safety Council's Committee on Winter Driving Hazards, show that traffic death rates during these months increase as much as 53 per cent in snow belt states. Principle factors for the high increase in accidents per mile traveled when severe weather and road conditions prevail, are inadequate traction and poor visibility.

These two menaces to winter driving can be combated by following two basic rules:

1. When visibility is poor, be alert and drive slowly. Make sure wiper blades really wipe clear, free of smear, and that defrosters work well.

2. When dangerous snow or ice prevail, use tire chains and adjust speed to weather and road conditions.

Maintaining visibility is important. It is equally as important to maintain stop-and-go traction by using tire chains when road conditions warrant their use. The results of tests conducted by the National Safety Council show that automobiles equipped with tire chains on rear wheels are able to shorten their braking distance on snow or ice 40 to 50 per cent over bare tires. This stopping distance is even more pronounced with trucks using tire chains, the braking distance being reduced 60 to 70 per cent. (See charts)

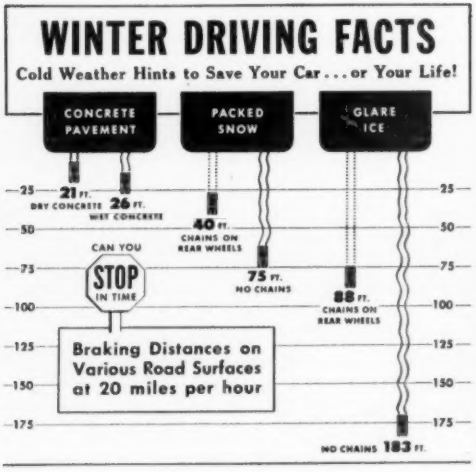
Though many drivers carry tire chains in their trucks or cars, they are prone to neglect using them mainly because they do not like to go to the trouble of putting them on. Putting tire chains on is easy when you know how. Here is a simple method for car or single tire trucks:

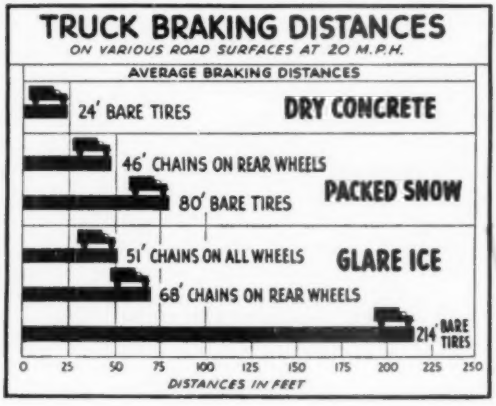
1. Place the chain over the top of the tire with fasteners to the rear. Tuck the first cross chain under front of tire.
2. Run car or truck ahead until fasteners hang even with the axle.
3. Lift up the two side chains that are now back of the tire and fasten. Fasten inside chain first.

This can be done in a few minutes with little effort.

Still another method of putting on tire chains is with chain appliers. They are necessary with some model cars that have low-skirted fenders. These appliers, usually "U" shaped, are of spring steel and snap on the tire. The chain ends are hooked on the appliers and when the vehicle is moved ahead, the chain encircles the tire. Appliers enable you to put on chain in six minutes or less. They are generally available and some chain manufacturers furnish them with each set of tire chains.

There is no substitute for tire chains when the going is slippery, whether it's on hard-packed snow or ice, according to tests. Not only do chains reduce skidding, they also provide needed extra traction often needed when starting or going up steep inclines. And the driver who realizes tire chains are as essential as other functioning parts of a motor vehicle when bad snow or ice exists is rewarded by getting through safely and on time . . . when many cars are skid-wrecked or stalled.




TRUCK BRAKING DISTANCES
ON VARIOUS ROAD SURFACES AT 20 M.P.H.
AVERAGE BRAKING DISTANCES
24' BARE TIRES
DRY CONCRETE
46' CHAINS ON REAR WHEELS
80' BARE TIRES
PACKED SNOW
51' CHAINS ON ALL WHEELS
68' CHAINS ON REAR WHEELS
GLARE ICE
214' BARE TIRES
0 25 50 75 100 125 150 175 200 225 250
DISTANCES IN FEET

Charts by courtesy of the National Safety Council.

SAFETY

Your Truck's As Safe As You Make It

(A Safety Engineering Picture Story)

All Photographs by Three Lions

1. When loading the truck, the driver should try to be present or at least find out what has been loaded, how it has been distributed through the trailer or body, and how much it weighs. A two-ton truck filled with twice its capacity will not respond to normal braking in the normal manner. If the truck is being loaded up to the ceiling, as it is here, it should be loaded that way all through the body. Otherwise, a sudden stop will toss upper cartons into empty spaces.

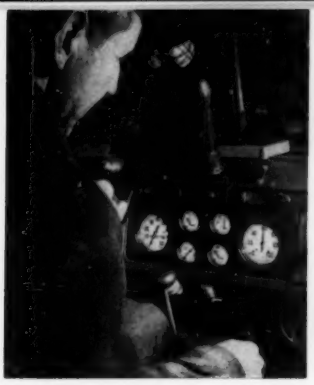
2. Of course you won't forget to link up your brake air lines to the trailer brake. But make sure that you link the proper hose to the proper connection or you'll pull a dud when you apply the brakes and the trailer unrespondingly jackknifes on you.

3. During icy weather particularly, make certain that your sand box is supplied with grit before going out on a trip. You may never know when you may have to pull to a stop on an icy or slippery slope. Check your tire chains too. They are a great safety factor to provide traction and help prevent skidding on ice and snow covered roads.

4. Is your fire extinguisher working? Has it been used and then not recharged? Has it been tampered with? Especially in hot dry weather, the carbon tetrachloride tends to dry out at the filler cap. See that there is enough in the cap to operate the extinguisher. Keep it where it belongs in its clamp so that you can get at it quickly, and not under a bundle of rags beneath the seat.

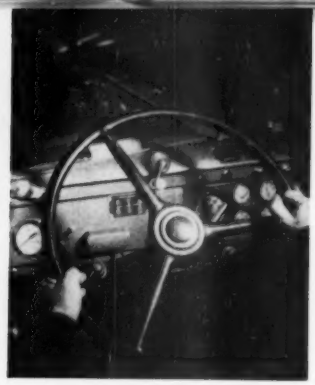
5. Your rear view mirror probably was in perfect alignment when you left the truck last. But it may have been swung out of position during maintenance or cleaning. Make certain that you can see what the score is as you get in for a new trip.

(Continued next page)



6. Is your air pressure up to par? It should be between 40 and 80 at all times or your air brakes won't respond properly. If the air pressure falls below that minimum, stop operation of the truck at once and start checking. It is very likely that the air hoses may be leaking, or that the fan belt of the pump is out of commission.

7. Learn to use your trailer brake as it should be used. Equilibrium between the foot brake of the tractor and the hand brake shown here is essential to prevent jackknifing. When going down hills or slopes, the brakes should be applied only to the trailer, which will then hold the tractor in position. To apply the brakes to the tractor would mean possible jackknifing.



8. Let the other fellow know what you are going to do. Use the switch which operates the arrow directional signal lights. Make certain that these all-important lights, your only liaison with other drivers, are in working order. Directly above this switch is the two-speed axle adjustment. When in the city or congested traffic, always switch to low; when on the straightaway, switch to high.

Your Truck's As Safe As You Make It

9. (left) A breakdown at night need not lead to further mishaps if you are equipped with night flares or emergency lanterns to set along the truck. The driver should see to it that flares are filled with fuel at all times. Recently, a policeman checking for flares on a truck was satisfied that the driver had them, but the latter was tripped up when he could not produce any matches to light them. The cop gave him a ticket. This is an extreme case, but it proves that drivers cannot be too careful in checking over their equipment. The driver shown here has gone up on the side of the road along a ramp in the curb—running up on a curb ruins tires.

10. The trip is over, but you're still in danger if you blithely traipse out of the cab without looking around to see if there are other vehicles approaching. When on the road, if you must get out, alight from the curbside of the cab.

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WHEN to use them
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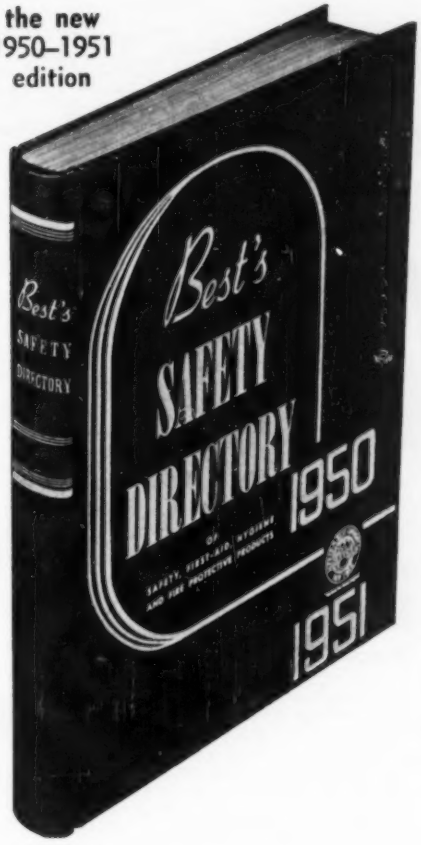

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H. S. COVER, South Bend, Ind.

Look for the Approval Label

(From page 24) points above the roof peaks and along the roof ridges to points above the chimney and then down the corners of our buildings and into the ground, we can be certain that they will be used. Our buildings will be well protected if there are enough of these roads.

Underwriters' Laboratories, Inc. master labeled lightning protection system assures the owner or tenant of the building of the following:

1. It is a system which is known to be correctly installed according to well-established rules.

2. Its units are the product of a reputable manufacturer.

3. Each unit has been made to specifications and is known by test to be capable of accomplishing its intended purpose.

To make sure that the product complies with the preceding three points, Underwriters' Laboratories, Inc. not only inspects the product in the factory as made, but also inspects a substantial number of installations in the field to see that labeled materials and correct methods of installation have been employed.

The achievement of safety in the use of electricity is not a spectacular subject, nor will the end be gained by spectacular methods. Constant and persistent effort on the part of a large group of people trained in the subject will go a long way in accomplishing this end. Each individual can assist in this effort by observing the following practices:

1. Buy intelligently.
2. Install properly.
3. Use safely.
4. Always ask oneself, "Is this approved by Underwriters' Laboratories, Inc."

Pictures by courtesy of Underwriters' Laboratories, Inc.

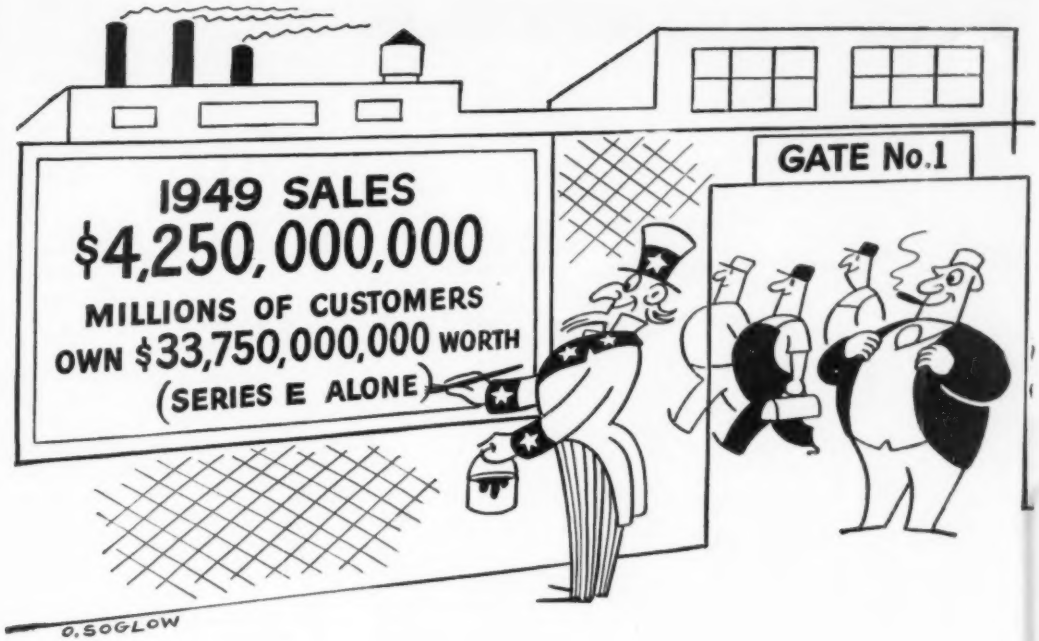
Ansul Chemical Elects

ROBERT C. HOOD has been elected president of Ansul Chemical Company, Marinette, Wis., succeeding his brother, F. James Hood, who died suddenly in New York, November 10. The 32 year old new president had been named vice president less than two years ago.

Ansul also created a dual vice-presidency. Sales Director Leonard C. McKesson was named vice president in charge of sales and Arthur C. Pope was elevated to vice president in charge of manufacturing.

Robert C. Hood has been associated with Ansul for 10 years. He worked in finance, sales, advertising—interrupting his business career during the war to serve for three years as a lieutenant senior grade in the Coast Guard. He saw action at Guam, Okinawa and other Pacific combat areas.

Besides sulfur dioxide and methyl chloride, used widely in the refrigeration industry, Ansul also makes a complete line of dry chemical fire extinguishers as well as paper products, synthetic rubber, plastics, leather, etc.



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Indirect benefits accrue from the effect of Bond sales on the national economy—on which, of course, the future of all companies depends. That future becomes more secure because Bond dollars add up to a tremendous backlog of purchasing power —money that will buy *your* products or services in the years to come. What's more, Bond sales improve the equilibrium of our economy by spreading the national debt.

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3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Plan's benefits to them.
4. Make a person-to-person canvass once a year, to sign up participants.
5. Urge each new employee, at the time he is hired, to sign up.

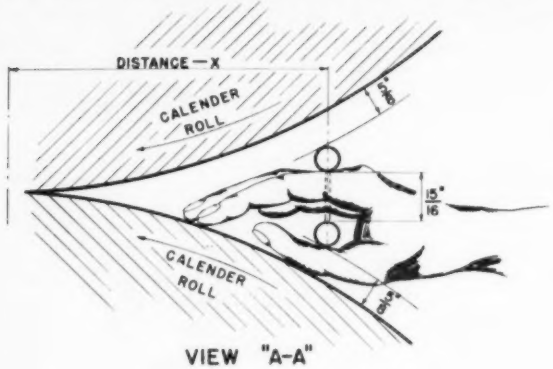
For all the help you need, get in touch with your State Director, U. S. Treasury Department, Savings Bonds Division—or write the Savings Bonds Division, Treasury Department, Washington, D. C.

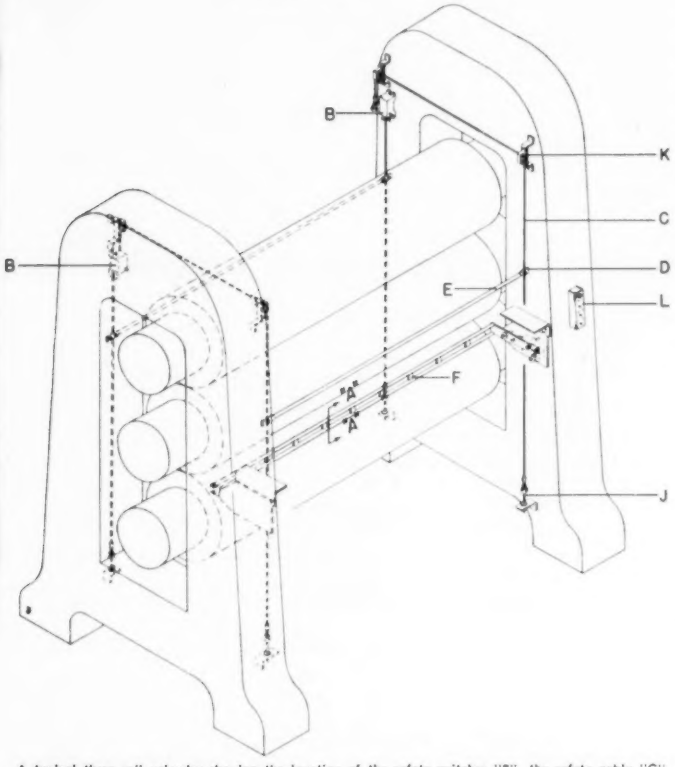
The Treasury Department acknowledges with appreciation the publication of this message by

SAFETY ENGINEERING

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

New Code for Rubber Mills & Calenders





A typical three roll calender showing the location of the safety switches "B", the safety cable "C", and horizontal bars or cables "E". The stop button is at "L". A new safety feature is the finger safety bar at "F". The top view "A-A" shows how the finger safety bar protects the hands in feeding a fabric or liner into the roll bite. A slight movement of the bars up or down trips a pair of safety switches mounted at either end of the bar.

(From page 21) braking devices which permit mills and calenders to be stopped in shorter distances than possible heretofore. Formerly, mill stopping limits were determined in accordance with the diameters of the front rolls. This method failed to take into consideration or make any allowances for the variation in speeds of the mill rolls.

The revised code changes the determining factor for stopping limits to the surface speed of the front roll. This provides a much sounder basis for the limits and can be applied to any speed up to 200 feet per minute. The new code calls for stopping limits of 2% of the surface speed of the front roll in feet per minute for group-driven mills. For single mills, the limit is 1¾% of the front roll surface speed. The code also states that all mills purchased after the effective date of the code must stop within 1¾% of the front roll surface speed for group-driven mills and 1½% for single mills.

The methods of determining the stopping limit requirements for calenders have not been changed except in the case of new equipment. The old code used drive roll surface speed as the determining factor and 2% as the limit. The revised code continues the practice for all existing calenders but requires that calenders purchased after the effective date of the code be capable of stopping within 1¾% of the surface speed of the drive rolls. Also for new calenders, this requirement is projected up to roll surface speeds of 250 feet per minute, whereas for old equipment, the projection of 2% is still only carried up to surface speeds of 200 feet per minute, as it was in the old code.

At a meeting in New York on June 3, 1948, the Code was unanimously approved by the committee. At this meeting, it was recommended that an appendix to the code be drawn up including photographs and drawings. Within a few months this material was received. Mr. W. M. Graff of the United States Rubber Company put the appendix material in proper form for submission to the American Standards Association.

The illustrations shown in the appendix will assist in the application of the code to both mills and calenders. The illustrations show actual working machines. The photographs were taken at many of the leading rubber companies, and the illustrated safe methods have all been worked out and are in operation. The appendix shows

many different methods of solving difficult problems that often arise. Included in the appendix is a recommended form for use in recording stopping distances. Suggested specifications for the construction of mills and calender safety switches and emergency release provisions are also contained in this section of the code.

The sketch shows a typical three roll calender and the location of the safety switches "B", the safety cable "C" and horizontal bars or Cables "E". The stop button is shown at "L". A new safety feature is the finger safety bar shown at "F". The view at "A-A" shows the manner in which the operator's fingers can be protected in feeding a fabric or liner into the roll bite. A slight movement of the bars up or down trips a pair of safety switches mounted at either end of the bar.

This revised code is an extremely valuable source of up to date information in the safe operation of mills and calenders. No manufacturer or user of rubber mills and calenders should be without this code. It can be purchased by writing direct to the American Standards Association, Inc., 70 East Forty-Fifth Street, New York 17, New York, and is known as the "Safety Code for Mills and Calenders in the Rubber Industry B-28.1."

From an address presented at the 1949 National Safety Council. Drawings by courtesy of The United States Rubber Co.

E. E. I. Accident Prevention Committee Meeting

THE next meeting of the Accident Prevention Committee, Edison Electric Institute will be held on February 9th and 10th at the Hotel Shamrock, Houston, Texas.

Public Utilities are invited to send representatives to this meeting which is expected to be most interesting and constructive. Contact Mr. W. T. Rogers, Safety Consultant, Ebasco Services, Inc., 2 Rector St., New York 6, N. Y., if you plan to attend.

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Ship Chemicals Safely

Fig. 4. Typical fiber drum for hazardous materials.

(From page 17) the I.C.C., having been included June 2, 1911. As a general use package, the carboy may be employed for certain commodities under all but one of the five general dangerous articles classifications, compressed gases being the exception. Strength and reliable performance of this package is assured through specifications of the glass bottle and the wood box in addition to a requirement for periodic retesting.

Under the present specification, glass bottle weight and sidewall thickness must be equal to or greater than prescribed minimum limits. (Fig. 1) Bottles are required to be permanently marked to indicate maker and year of manufacture, and the manufacturer's code mark must be registered with the Bureau of Explosives.

Wooden boxes for holding the glass carboy are required to be made of wood of acceptable quality, the top, sides, bottom, and ends to be made from lumber of prescribed minimum thickness, while minimum cross sectional dimensions are specified for vertical corner posts, carrying cleats and shoes. Nail sizes and spacing are also specified. The box must be marked with "Name or symbol (letters) of company setting up the package, or other party assuming responsibility for its compliance with specification requirements" and with the mark "I.C.C.-1A" which is certification that the "complete package complies with all specification requirements."

After assembly, the boxed carboys must be tested for ability to withstand shocks on special equipment designed for the purpose, and this test must be made each six months thereafter as long as the packages are in service, one of the semi-annual tests being witnessed by a representative of the Bureau of Explosives in each twelve month period.

Steel Drum—I.C.C.-5A

Drums of this design are in use more commonly for the shipment of corrosive, flammable and poisonous liquids. (Fig. 2) They are authorized for capacities up to 110 gallons. Specification requirements involve minimum thickness of drum body and head sheets, side seam welding, type of rolling hoops, design of closures, capacity tolerance and performance testing of finished container.

For certification, each drum is required to have embossed markings on one head, including "I.C.C.-5A," the name or symbol of the manufacturer, gauge of metal, rated capacity, and year in which it was produced.

Each finished container must undergo a leakage test by being subjected to internal air pressure of at least 15 pounds per square inch, with soapsuds or other suitable covering being used to detect a point of leakage. Any container in which a leak is found must be rejected unless repaired and retested. Representative samples (not each one) must not leak when tested as follows:

(a) By internal hydrostatic pressure of 80 pound per square inch for 5 minutes.

(b) By dropping 6 feet onto solid concrete, diagonally on chime, the drum being 98% full of water.

Steel Drum—I.C.C.-17E

Authorized only for single trip service, this drum is found in service for shipment of flammable, oxidizing and poisonous liquids. (Fig. 3) It is one of a series of drums, capacities up to 55 gallons, constructed to this general specification which involves minimum body and head sheet thickness, requirement for welded side seams, general provisions to assure adequate closures, volumetric capacity tolerance limits, and performance tests. Drums must be marked "I.C.C.-17E" to certify compliance with all specification requirements and "STC" which indicates service only as a single trip container. Other markings are equivalent to those applied to drums of I.C.C.-5A construction.

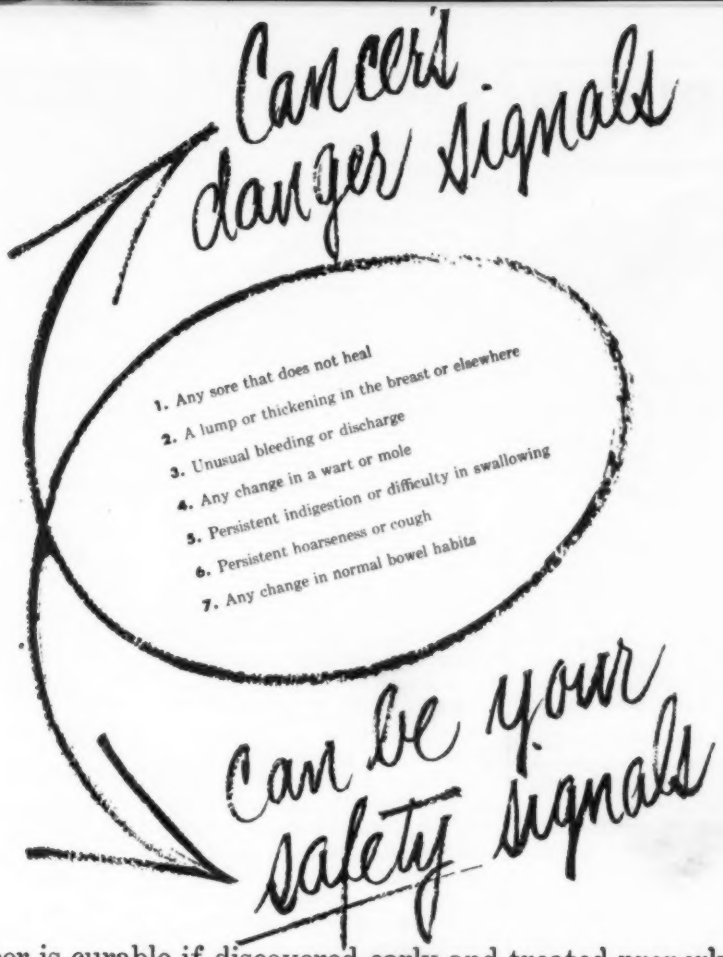
Each drum must pass a leakage test under internal air pressure of 5 to 7 pounds per square inch, depending upon drum size, while representative samples, selected periodically, are subjected to two additional leakage tests, these being:

(a) A hydrostatic test of 15 pounds per square inch for 5 minutes and

(b) By dropping from a height of 4 feet onto solid concrete, to strike diagonally on chime, when filled to 98% with water.

Fiber Drum—I.C.C.-21A

Fiber drums find service particularly in the transportation of oxidizing materials and poisons. (Fig. 4) Although for certain commodities in these groups additional precautions in protective design are called for, the basic specification must be complied with in all cases. This includes minimum strengths of fiber sidewalls and heads and minimum thickness of heads, either wood or fiber. These standards


Cancer's danger signals
1. Any sore that does not heal
2. A lump or thickening in the breast or elsewhere
3. Unusual bleeding or discharge
4. Any change in a wart or mole
5. Persistent indigestion or difficulty in swallowing
6. Persistent hoarseness or cough
7. Any change in normal bowel habits
can be your safety signals

Cancer is curable if discovered early and treated properly

If any of these symptoms appear, see your doctor *at once.*

Write for the booklet about cancer. Just address your request to "CANCER"

AMERICAN CANCER SOCIETY, INC.

vary according to drum dimensions and authorized net weight of contents. Metal covers were also permissible subject to approval of Bureau of Explosives.

As evidence of acceptability, representative samples of drums must withstand the following tests, without leakage, when filled with dry, finely powdered material:

(a) By dropping from a height of 4 feet onto solid concrete, to strike diagonally on (1) top chime, (2) drum closure, (3) end, or any other weak point.

(b) By application of 1000 pounds compression on drum top.

For certification of compliance all drums must carry required markings which include "I.C.C.-21A" with authorized gross weight and code of the manufacturer.

Fiberboard Drum—I.C.C.-12B

Boxes made under this specification may be of solid or corrugated fiberboard. Being included in a group of similar specifications, the I.C.C.-12B box is authorized as an outside package for small inner containers of flammables, oxidizing materials, corrosive liquids, and poisons. Often specific limitations are set on the size of inner containers for any given commodity, while further special requirements may depend upon the nature of the material to be shipped.

In every instance, however, the basic specification is a prerequisite, and involves thickness and strength of fiberboard, types of staples or tape employed for joints, methods of making joints and closures, and the further stipulation that inner containers be packed so as to afford adequate protection against break-

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Sellstrom No. 602 Industrial Eyeglasses have all the appearances of expensive prescription glasses.

These industrial eyeglasses were especially designed to supply the demand of workers who object to goggles because of their appearance. These glasses have "class," "eye appeal."

The demi plastic molded transparent amber colored frame is attractive as well as practical.

The frame and temples will fit most faces, but can easily be adjusted if necessary.

The temples are fastened with sturdy optical hinges. The lenses are of the "snap-in" type.

These glasses weigh only 1⅝ ounces. Each pair comes in a case made of tough long-wearing leather grain plastic.

These eyeglasses are furnished with 42 x 45 m/m dropeye lenses as follows:

602 LCH 1.25 Diopter Curved Clear XL Hard Lens
602 LCA Clear Flat Sel-Hard Lens
602 LGH 1.25 Diopter Curved Sel-Green Lens
602 LCG 6.00 Diopter Curved Clear XL Hard Lens

On request we will gladly mail a pair, on memo for examination purposes. Be sure to specify the type of lens desired.

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age or damage. Each box must contain marking which includes "I.C.C.-12B," the authorized gross weight and the symbol or letters of the box maker.

Nailed Wooden Boxes—I.C.C.-15A

This is one of a family of specifications for wooden boxes authorized for the packaging of inner containers of a wide variety of commodities classed as flammables, ozidizing materials, corrosive liquids, and poisons. Size and quantity of inside containers, usually glass or metal, may be limited according to the specific commodity shipped, while in some instances the character of the material warrants a further restriction on inner container design.

In addition to naming principal woods which may be employed in fabricating the box, the specification is quite detailed as to prohibition of inferior quality lumber, direction of grain of wood, and thickness of lumber for boxes of various gross weights and for different dimensions, the latter being covered by a series of tables. Specifications for nails, nail sizes, and spacing are covered.

Boxes must be marked with "I.C.C.-15A" and the authorized gross weight, and when closed for shipment the completed package must be in condition to withstand ordinary conditions of transportation without rupture or leakage of contents.

Employee Protection

In addition to the protection afforded through the mandatory use of I.C.C. containers by shippers of chemicals, the consumer has available further means of promoting safe handling of chemical products in his plants. This is in the form of warning labels on chemical packages, and manuals and other literature usually furnished by the manufacturer for guidance to those who may not be so familiar with product characteristics.

The Manufacturing Chemists' Association, recognizing the need for uniform labeling of chemical commodities for consumer protection, has developed a system for defining briefly the principal precautions to be observed in handling products, based upon the principal physical characteristics and hazards of the particular material. This is outlined in the Association's publication "Warning Labels" which also contains precise wording recommended for a great number of the more common industrial chemicals.

Adequate uniform precautionary information on labels permits the worker in industrial establishments to receive first-hand information on the safeguards required for his own protection and for the security of others who may be associated with any process in which the particular product may enter. For example, packages holding sulfuric acid would have attached labels bearing the following:

> **SULFURIC ACID**
>
> **Danger! Causes Severe Burns**
> **Do not get in eyes, on skin, on clothing. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes; for eyes, get medical attention.**
> **Do not add water to contents while in a container because of violent reaction.**

This type of brief information is intended solely for guidance of the individual worker to warn him about the precautions to be observed for a particular material. Such brief warnings do not replace the need for employee education concerning broad aspects of chemical handling hazards. The employer's duty is to insure that general safety measures are established and followed.

As further guidance in that direction the Manufacturing Chemists' Association publishes, for distribution at a nominal charge, pamphlets containing more exten-

sive information based upon chemical industry experience, on properties of certain hazardous chemicals. The series known as "Manual Sheets" contain recommendations on handling and storing containers, while those titled "Chemical Safety Data Sheets" present essential information on the properties of the chemical involved with pertinent data on its safe handling and use.

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2. Crass, M. F., Jr., "Development of Safe Transportation for Dangerous Articles," Chemical and Engineering News, pp. 16-27, Vol. 23, January 10, 1945.
3. Warning Labels, Manual L-1, Second Revision, 1949, Manufacturing Chemists' Association, Inc., Washington.

Pictures by courtesy of the following: Fig. 1—Manufacturing Chemists' Association; Fig. 2 & Fig. 3—Republic Steel Corp.; Fig. 4—Continental Can Co.

American Optical Opens New Research Laboratory

AMERICAN OPTICAL COMPANY's new research laboratory in Stamford, Conn., was opened on Nov. 30 by the company's Board of Trustees which transferred its regular monthly meeting from the firm's Southbridge, Mass. headquarters to the laboratory "as a symbol of industry's interest in scientific research."

"The research which will be conducted in the Stamford Research Laboratory of American Optical Company," Walter A. Stewart, president, told the group, "is an extension of our long-time research program."

"We considered many suggestions of ceremony which would have been appropriate to the opening of the Stamford Research Laboratory," Mr. Stewart disclosed, "but we discarded them in order to add to the public's understanding of business' participation in scientific research. It seemed to us fitting that the laboratory should be opened by the Board of Trustees who, representing the shareholders, are responsible for the decisions which make dollars available for research program and facilities. Likewise, we felt that a regular monthly meeting of the board in the new quarters would serve as a symbol of industry's interest in scientific research."

The inspection tour of the laboratory was conducted by Dr. R. Bowling Barnes, vice-president in charge of research, assisted by A. H. Bennett, director of the Stamford Research Laboratory. Dr. Barnes explained that the laboratory supplements the research facilities and program of the company. He said that the new laboratory's program "looks to the development of new or improved scientific instruments involving optical principles and of new or improved lenses of all types including those for eye glasses." Studies will be conducted in geometrical optics, microscopy, photographic optics, spectroscopy, glass chemistry, instruments and optical materials.

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Horse sense about **ATHLETE'S FOOT**

91 skin specialists condemn old-fashioned foot baths as being "illogical and potentially harmful to the skin."
(*Archives of Dermatology and Syphilology for April, 1942*)
The best way to prevent Athlete's Foot, say these specialists, is to *stop* trying to disinfect the feet. Concentrate instead on improving the condition of the skin.

A sound skin is nature's best protection against fungus attack
That is good horse sense. And it's the basic principle of the Onox skin-toughening method of Athlete's Foot prevention. Onox mineral salts counteract the skin-softening effect of wearing shoes. Onox makes the skin as tough as nature intended it to be—tough enough to resist fungus growth. No fungus growth—no Athlete's Foot.
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President's Safety Conference in June

AS A further impetus to reduction of industrial deaths and accidents, the President's Conference on Industrial Safety will hold its second national meeting in the Departmental Auditorium, Washington, D. C., June 5, 6, and 7, 1950, Secretary of Labor Maurice J. Tobin who is general chairman of the conference has announced.

The conference will be a progress report meeting and will be designed to take an inventory of accomplishments in the field of industrial safety since the first meeting in March 1949 and to determine future methods of approach whereby the death and accident toll may further be decreased. Revision of the conference's eight technical committee reports and the Plan for Action for industrial safety will be major business on the agenda.

Preliminary details for the June conference were discussed in September in Washington at a meeting of the conference coordinating committee. It was agreed that, because of the limitations of space, attendance at the second conference would be controlled by this factor. Those who will be invited to attend include the coordinating committee of the conference, the technical committees, Governors of States or their representatives, leaders and safety experts representing management and labor, and representatives of a group of non-official organizations with a direct interest in industrial safety.

According to present plans, the 3-day session would bring all agencies throughout the country together in a concerted effort to increase State participation in the industrial safety program by cooperating in the organization of Governors' Conferences on Industrial Safety to formulate State plans of action to cope with the situation. Special emphasis will be placed on the need for more widespread adoption of sound safety procedures in smaller plants where 70 percent of the industrial death and accident toll is recorded annually.

Revision of reports in line with the experience gained from a year's operation since the first national conference will be one of the principal activities of the conference. Plans are also under way to include panel discussions on subjects vital to the success of the continuing program.

Ten Governors' Conferences

Ten States are in process of organizing Governors' Conferences on Industrial Safety patterned after the President's Conference on Industrial Safety held in Washington last March. Five other States are considering preliminary plans with the intention of holding conferences some time in 1950.

Michigan held a conference last May.

Illinois will hold a conference April 19–20, 1950. A meeting of the Illinois coordinating committee to discuss plans for the conference was held October 27 in Chicago.

Rhode Island is rapidly completing plans for a full scale Governor's conference in the spring. Rhode Island held its coordinating committee meeting October 20 in Providence.

Montana's Governor John W. Bonner has issued a proclamation announcing a Governor's conference for December 2–3, 1949, in Helena. Cyril Ainsworth, technical director and assistant secretary of the American Standards Association and a member of the coordinating committee of the President's Conference on Industrial Safety, delivered the principal address. Mr. Ainsworth played an active part on the Laws and Regulations Committee for the President's Conference.

California held a coordinating committee meeting October 13 in Los Angeles. More than 700 attended the session, which was held

in the Biltmore Bowl. Plans were discussed for a Governor's conference on industrial safety to be held early in 1950.

New Jersey held a coordinating committee meeting in Trenton, September 20. Plans for a conference on December 1, 1949, were prepared.

Oregon held a coordinating committee meeting September 19. Plans for a full scale conference on December 1–2 were discussed. Mr. Ainsworth also addressed this conference.

A coordinating committee meeting was held August 19 in Duluth, Minnesota, to lay plans for a full scale Governor's conference, February 3, 1950.

Washington held a Governor's industrial and traffic safety conference in Olympia, October 5–6.

West Virginia also announced a preliminary meeting at Charleston for November 15 to make plans for a Governor's conference. A chart was compiled as a guide to conference organization.

One of the major recommendations by the national conference called by President Truman last March placed primary responsibility for industrial safety programs with the States. The holding of Governors' conferences on industrial safety was urged as a means of centering public interest on the problem with officials of State governments and prominent leaders in labor and management combining their efforts to produce a plan for State action to reduce deaths and injuries in industry. Nationally, there were 16,500 recorded industrial deaths in 1948 with a total of approximately 86,000 permanently disabled. Total industrial accidents reached 1,960,000.

The President's Conference on Industrial Safety is a continuing organization for which the United States Labor Department's Bureau of Labor Standards is secretariat. Secretary Tobin is general chairman of the Conference and William L. Connolly, Director of the Bureau, is chairman of the Coordinating Committee.

The President's Conference has offered its advice and assistance in matters of organization and procedure to those States which hold industrial safety conferences.

Rhode Island has actively entered into the organization of a conference patterned after the national meeting. The conference is being organized with Arthur W. Devine, Director of the Rhode Island Department of Labor, as executive director. A plan of procedure and organization has been formulated outlining the steps to be taken leading up to the Statewide conference in the spring of 1950.

New Jersey has also compiled a conference plan with C. George Krueger, Director, Engineering and Safety Division, as conference director. The New Jersey plan outlines conference objectives, committee organization and functions, and plans for preliminary meetings leading up to the Governor's conference.

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Here's the new, safer way to handle heavy loads — use BTC Drop Forged Safety Hooks. These sturdy hooks feature automatic mousing and a safety-tie lip lock that affords . . .

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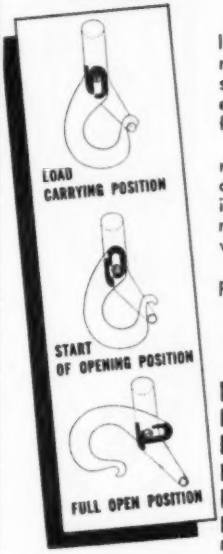

BTC's mousing automatically engages when loads are applied; disengages when loads are released. The special shoulder and lip lock construction maintain the load carrying capacity even if pin should be sheared. All bearing surfaces are machined for accuracy.

Constructed from drop forged steel to insure maximum strength, BTC Safety Hooks are available in two sizes and types — 5-ton and 10-ton in either Eye Bridge or Shank Bridge. Both sizes replace eight standard open hook sizes, yet weigh only one-third as much.

For safer load handling, order BTC Drop Forged Safety Hooks from your supplier today.

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Radio System Speeds Repairs

WAR-LEARNED techniques for communication between headquarters and mobile units have been adopted to smooth out the kinks in the maintenance division of A. E. Staley Manufacturing Company's corn and soybean processing plant at Decatur, Illinois.

The huge milling company now has its own radio station. Two-way conversations are possible between maintenance headquarters and the cabs of Staley's mobile cranes, trucks, fork tractors, trash handling equipment and the units which carry both materials and personnel to repair jobs in all parts of the plant. The operation includes a powered "tractor train" which travels over the roads of the 300-acre plant on scheduled delivery service. It is dispatched by radio.

"When a breakdown occurs in a plant of this type a certain number of employees must just stand by and wait until the repairs are made," Charles F. Gebhardt, superintendent of maintenance, said. "Delays for repairs may mean the difference between operating at a profit or a loss for that particular period. We hope to speed up our repair operations with this new installation."

For instance, a conveyor belt break can be expensive. When this happens, an electrical repair crew working elsewhere on a "non-rush" job can be found quickly and dispatched to the scene. If they find that the motor cannot be repaired on the job, they report to the dispatcher, who orders the warehouse to pull one out of stock and load it on a wagon. The dispatcher then locates, by radio, a truck or tractor unit which can pick up the motor and rush it to the place it is needed.

"The odds are that they will get there with the replacement before the repair crew has the old motor off the motor base," Gebhardt explained. "Under the old system we would have to send someone after the repair crew, then when they learned that a replacement was necessary they would go to the warehouse after it themselves and bring it back to the place where it was to be installed. The time lost might be only an hour or so for the repair crew, but it would mean a good many hours lost by the employees whose work was halted when the conveyor belt stopped."

Plant cleanliness is improved by dispatching trash handling equipment to locations where full containers should be emptied immediately.

The new remote control unit rounds out the communication system which was installed when the Staley company recently built a new maintenance building. "Nerve center" of the maintenance operation is the dispatcher's office. In normal procedure, the office of the foreman in a particular part of the plant calls the dispatcher to tell him of needed repairs. Here a repair order is made out and sent by pneumatic tube direct to the desks of the maintenance foremen who will be responsible for the repairs. In some cases the services of three different crafts may be required for a single job and they all get the orders at the same time. A copy of the order also goes to the tool rooms and the materials supply rooms, where the stockroom men are alerted to be ready to deliver the needed materials.

Now, with the voice of Don Miller, senior clerk in the maintenance division and chief dispatcher saying "This is KSA 419, A. E. Staley Manufacturing Company, Decatur, calling repair unit number twelve," the modern technique of radio communication is helping the company to keep production and safety at a high level.

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Page 67
Reviews New Free Bulletins & Catalogs

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New Appointment at Pittsburgh Plate Glass

APPOINTMENT of Clarence J. Krueger as production manager for the paint division of Pittsburgh Plate Glass Company has been announced by E. D. Griffin, vice president.

Associated with the firm since 1927, Mr. Krueger has served as assistant divisional director of the Ditzler Color Division during the past three years. His first position with Pittsburgh's paint division was as a research chemist at the Milwaukee, Wisconsin plant.

During a four year period he served as a production efficiency expert and later as superintendent of the industrial enamel plant at Milwaukee. Prior to his entry into military service as an infantry captain ten months before Pearl Harbor, Mr. Krueger was responsible for general plant efficiency at the Milwaukee plant.

As production manager for the paint division, Mr. Krueger will have headquarters at the firm's Pittsburgh, Pennsylvania general offices. Plants operated by the divisions are at Houston, Cleveland, Detroit, Dayton, Milwaukee, Los Angeles, Pittsburgh and Springdale, Pennsylvania, Newark, New Jersey and Portland, Oregon.

"Bean Soup" for Fires

(From page 27) discharge of foam liquid into a piping system which distributes the foam liquid to the three stationary systems and to the nine portable hose stations located within the plant. One side of the foam liquid storage tank is always open as suction to the foam liquid pump. The other side of the storage tank is kept closed so that the system may be immediately returned to service following operation from fire. Metering of the foam liquid into the water piping system is accomplished by means of orifices. These are controlled by small companion valves operated pneumatically by six-inch deluge valves. The foam liquid operation is supervised by a 50-gallon cushion tank which will supply several minutes of foam operation to the portable units within the plant before the foam liquid pump cuts in from low pressure. The particular advantage of this foam distribution system is that it can be extended to use for similar additional systems or hose stations, simply by extending the piping and installing a proper sized orifice between the distribution piping and the new system. Full foam making capacity is thus available for use at any location within the plant.

Foam Production

Optimum foam making quality is based on a figure between five and six percent injection of foam liquid into water. The foam liquid injection was designed for these systems in such a manner as to allow for pipe aging and reasonable changes in water supply pressure. The system should operate efficiently for

New

FLEX-a-FOAM Filter Mask

Dust Protection

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Simple construction (only four interlocking parts), breathing ease and attractive styling of the new Flex-a-Foam Filter Mask assure real wearing acceptance by your workers.

Featherweight positive-locking frames of molded plastic adjust themselves with comfortable snugness to every size face. Of DuPont Polythene, frames are so tough they're unbreakable in normal usage.

Flex-a-Foam's filter is a honeycomb construction of whipped foam latex — keeps out non-toxic nuisance dusts as small as 1/25000 of an inch! It holds its shape and can be washed in warm, soapy water for long sanitary usage. It's easier to breathe through than an ordinary pocket handkerchief!

Headband of molded natural rubber with exclusive method of adjustment that keeps mask snug and comfortable — no tension or hair pulling.

Workers enjoy its comfort, and you like the efficiency and economy of Flex-a-Foam, lowest priced *quality* respirator ever made. Send $1.50 for postpaid single mask.

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Please send full information and prices on Flex-a-Foam Filter Masks.

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many years without the necessity of orifice adjustment. When mixed with water and aerated, the foam liquid in one compartment of the storage tank will form 58,000 gallons of smothering mechanical foam or a total of 116,000 gallons is available through the utilization of the entire storage of foam liquid.

Foam coverage from the systems is at a rate of about two inches of depth per minute. This is a more than adequate discharge and will provide for the extinguishment of fire in less than three minutes from the time of origin. Somewhat more than 7½-minutes supply of foam liquid is available from each section of the foam storage tank. In general, with the foam liquid presently available for the systems, the entire area could be covered with two foam blankets of about six inches in depth.

Aside from standard foam nozzles at each portable hose station location, special goose-neck applicators are provided for the extinguishment of any fire which might occur in the vertical storage tanks.

Tests of System

Final acceptance tests of the automatic systems at the Schenectady Varnish Company were conducted by the Factory Insurance Association and other interested parties on October 18 and 19, 1949. Aside from these standard tests, a full scale foam-discharge test of System #1 and portable hose stations was conducted. These tests proved the engineering design and the mechanical operation of all devices to be satisfactory.

The full scale test of System #1 was started by applying a heat testing pan to one of the heat actuated devices. Within 18 seconds, the six inch deluge valve had operated. It immediately started the foam liquid pump and opened its companion valve, thus starting the injection of foam liquid into the system through the orifice injection plate. Within 20 seconds of the operation of the control valve, the deflectors of the system were discharging foam at full efficiency. The system was allowed to operate for approximately 3$\frac{3}{10}$ minutes and used about 190 gallons of foam liquid during this period. The foam liquid injection rate was between 6 and 6½ percent, giving a 30 percent safety factor above the 5 percent minimum injection rate.

The foam coverage at System #1 was excellent and upon completion of the tests a foam blanket of approximately seven inches had been laid above the bed of the spur track. Following the completion of these tests, water was discharged from the system onto the foam blanket. No serious dissipation of the foam blanket was apparent. During water operations, it was noted that water, properly applied, may be useful in reducing the volume of foam liquired required for the control of fire. An interesting observation at the time of these tests was the fact that the removal of the foam blanket was amazingly simple since the foam dehydrated within a few hours and actually dissipated itself.

Conclusion

These tests indicate that systems of this type are now applicable for the protection of entire buildings and areas involving the handling and processing of materials such as hexane, benzol, gasoline and other volatile liquids. When installed, mechanical foam protection reduces the fire hazard to the equivalent of an ordinary sprinklered occupancy. Use of mechanical foam in this manner makes possible engineering economies in fire protection design of water supplies, drainage, etc., and provides for immediate extinguishment of spill fires. This type of system is at present proposed for several major plants which are processing and handling flammable liquids. Estimates of the cost of these systems show that a substantial reduction over other types of proposed fire protection is now possible.

Pictures by courtesy of the Automatic Sprinkler Corporation of America.

ASSE Chapter Visits Cornell

MEMBERS of the Central New York Chapter of the American Society of Safety Engineers were guests of the New York State School of Industrial and Labor Relations, Thursday, November 17th. Their visit to Cornell University was one event of the Chapter's education program.

Professor J. James Jehring, faculty member of the New York State School of Industrial and Labor Relations, and member of the Central New York Chapter of the American Society of Safety Engineers, was in charge of arrangements.

The forty-five members attending were welcomed by the M. P. Catherwood, Dean of the Cornell Industrial and Labor Relations School. Because of the Chapter members' interest in the safety aspects of nuclear physics, a lecture was given by Professor P. Morrison, faculty member of the Cornell University Nuclear Physics Department. A tour through the newly dedicated Newman Laboratory of nuclear studies followed, with an opportunity to view of synchrotron.

Professor Alpheus W. Smith, at a dinner sponsored by the New York State School of Industrial and Labor Relations, spoke on the "Idea of Cause." He stated that four concepts of cause must be considered in an effective safety program: the realm of the individual, the realm of the environment, the realm of the mechanism, and the end in view.

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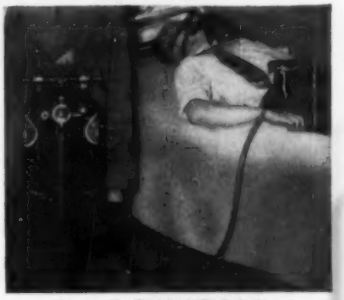

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6 Principles of Safety

(From page 13) our friends and associates from avoidable injury to body and health. So, in its real meaning, safety is something to which we cannot apply a measure. We provide safety devices and attempt to study the various phases of our operations and apply mechanical safeguards against human accidents and injury to health. However, the basic element of safety is mental, and not physical. We are all aware of the fact that 88 per cent of industrial injuries are termed as "human failure accidents." The purely physical approach sometimes leads to safety's receiving a lower rating of importance in our industrial practice than it rightfully deserves. If we can by our persistent efforts cause employees to think more definitely about present hazards we will accomplish more than by any other process.

Those of us who are interested in and charged with the responsibility of developing and promoting safety programs need to be aware of the necessity for keeping people constantly conscious of hazards which are always present.

To do this successfully means that we need more than safety-attention getters to keep people from

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exposing themselves to accidents unnecessarily.

It is important that we make safety a definite part of our daily routine and give it a permanent place in our working creed.

One of the greatest ways of promoting safety is to generate an atmosphere of safety at work. Surround employees with the physical evidence that action is being taken to guard against hazards. The very fact you put a safety device on a punch press indicates to the operator that a hazard is present; and the safety device, aside from restraining against dangerous movements, is a means of helping him recognize potential hazards.

How Accidents Happen

Accidents stem from one of three causes:

1. A deliberate disregard for hazard in the face of ample warning.
2. Failure to be alert to known hazards.
3. Being completely unaware of the existence of a hazard.

The first of these calls for definite action if we are to check deliberate disregard for safety warnings. These actions must be dealt with as positively as any other infraction of the rules of conduct. Deliberate disregard to hazards can lead to but one thing, and that is painful injury.

The second cause is perhaps the place where the most good can be done.

Signs and notices and other devices used in calling attention to safety regulations are only as effective as the individual makes them. They must be supplemented by our active interest to stimulate safety consciousness.

The third cause is lack of knowledge of the existence of a hazard. The supervisor in charge should make sure the employees thoroughly understand the potential hazards before they are permitted to start working.

The success of any safety record as it is related to past performance is an indication that the safety program as such has been basically correct.

In General Motors plants, the principles which guide our safety activities rest upon this conviction: that as long as one of General Motors employees gets hurt or is affected by an occupational disease, our job is not done. We consider that unless we show an improvement in our safety record for each year over the preceding year, we have not met our full responsibility.

This attitude of General Motors towards safety can best be explained by a statement made by the late William S. Knudsen in 1934, when, as executive vice president of General Motors, he said, "Safeguarding our employees is the most important task before us at all times."

In looking back over our safety experience, we find that our safety record is largely due to the balanced application of six general principles which we have recognized for a long time. These principles were formalized by C. E. Wilson, president of General Motors. In 1935 he spent more than three weeks visiting various GM plants to compliment the supervisory organization and employees on the splendid job they had done in reducing accidents. He found the following principles to be in common with those plants that were having the best safety records. These principles are now considered in General Motors to be minimum standards for safe plant operation.

Principle #1: Interest in Safety on the Part of Top Management. It is essential that the men who have the responsibility for the operation of the plant and the authority to change bad safety conditions have a sympathetic attitude towards safety and recognize it as a management responsibility.

Therefore it is recommended that the general manager hold scheduled safety meetings once a month with certain members of his top supervisory staff. This group should include the following:

Factory Manager
Superintendents
Plant Engineer
Personnel Director
Plant Physician
Safety Director

The functions of this group are:

1. To review the safety performance of the plant.
2. To discuss prevailing safety problems and make decisions for correction.
3. To formulate safety policies for education, guarding equipment, etc.

Principle #2: A Definitely Established Safety Organization Throughout the Supervisory Organization to Each Individual Employee. The general manager should meet with the top supervisory staff periodically to review the safety situation, discuss major safety problems, make decisions for correction, and formulate safety policies for mechanical safeguarding of equipment, good housekeeping, education, etc. Superintendents should meet with their foremen at least once a month to explain the general safety policies of the division as approved by top management.

Foremen should talk to two employees daily regarding the safety policies and the safe practices necessary on their particular operation.

Under Principle #2 the foremen are held responsible for the following:

1. To understand fully the general safety policies of the division.
2. To consider as a major responsibility the supervision of safety in their own departments.
3. To write out all orders for safety guards or appliances for their departments.
4. To follow up and see that these requests are met.
5. To discuss safety with two or more of their employees individually each day, devoting at least five minutes to each one. In this manner, each foreman spends at least ten minutes each working day giving safety instructions to individual employees. A record of these talks should be maintained in the department on forms provided by the safety director. The most important part of the entire program so far as the foremen are concerned are these regular day-to-day discussions of safety with their employees.
6. To instruct new operators on safe operation of the equipment on which they will work. (This is in addition to the instruction of new employees by the safety director before they start work.)
7. To see that old operators who are transferred into the department are instructed in the safe operation of the equipment which is new to them.

The foreman must recognize that the safety of their subordinates is just as much a part of the job as production schedules, labor rela-

(Continued next page)

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tions or quality control.

Principle #3: Adequate and Capable Full-Time Safety Personnel. Each plant should have a full-time capable man to supervise a continuing safety education program and assist the supervisory organization in maintaining safe working conditions in the plant. He should have a sufficient number of safety inspectors to cover all shifts.

Total employment, type of product manufactured or assembled and physical characteristics of the plant are all factors which determine the size of a safety department. Its general duties are as follows:

1. Supervise the general safety education program for both new and old employees and present various types of promotional activity in order to stimulate the entire safety program.
2. Maintain contact with the plant physician and the industrial hygiene engineer so that the "danger spots" in the plant can be studied and intelligent efforts applied toward accident prevention and control of occupational disease.
3. Investigate all lost-time and near lost-time accidents and make reports covering the essential features of these accidents for distribution to members of the management group.
4. Make daily plant safety inspections.
5. See that written safety procedures and instructions are provided for each occupation.
6. Suggest changes in procedures or processes if hazards are involved.
7. Recommend necessary safety equipment for the job, such as aprons, boots, shoes, goggles, etc.

Experience has proved that a safety inspector should spend approximately 90 percent of his time in the plant spotting unsafe conditions and unsafe acts. His findings are then reported directly to the department foreman. It is then the foreman's responsibility to issue orders for the correction.

Principle #4: Written Safety Procedure and Instructions for Each Occupation. Safe practices and safety rules evolved by experienced operators should be put in writing as safety instructions for each occupation so that the new operator can profit by the experience of others. These instructions should be kept up-to-date.

In a large plant with diversified manufacturing, this is a tremendous undertaking. However, this is done by asking the foreman in each department to formulate the safety rules for all occupations under his supervision. The safety department lends the necessary assistance to the foreman in accomplishing his task.

The rules when approved for a particular operation are then used in the instruction of new employees. The foreman also makes use of these instructions in his daily five-minute safety contacts with employees until he is satisfied that they are thoroughly familiar with the safety

ASSE Appoints

WILLIAM N. COX, Jr., professor and head of the Georgia Tech Safety Engineering Department, was appointed eastern regional representative of the American Society of Safety Engineers, according to an announcement by E. C. McFadden, Dallas, Texas, national president.

One of the principal duties of Professor Cox will be the organization of a regional meeting of the Society to be held in conjunction with the annual Southern Safety Conference in Memphis, Tenn., March 5, 1950. Other duties include the coordination of the work of the Society's chapters, especially their cooperation with local and state agencies.

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rules for their particular jobs.

Principle #5: Thorough Safety Instruction of New Employees. New employees should be thoroughly instructed in the safe operation of their jobs before they start to work. Employees should be contacted frequently to make sure that the safe practices are being followed.

After new employees have completed their physical examinations, they are taken in groups to a conference room where they are given an induction talk which includes a brief history of the company, the products manufactured and general plant policies. The safety director explains the safety rules of the plant and each employee is given a copy of the written safety instructions for the job to which he has been assigned. A varied assortment of safety apparel and equipment is also exhibited and explained.

When the employee has completed the induction program, he is assigned to an operation and turned over to his foreman. The foreman explains the operation upon which he is going to work and again reviews the safety rules applicable to his particular operation before he is permitted to start to work. A daily follow-up is made with the employee to make sure that he is observing the established safety procedures.

Principle #6: Stimulation of Interest in Safety on the Part of Every Employee. The subject of safety should be brought forcefully to the attention of the entire organization periodically through the medium of daily contacts with the employees, posters, safety exhibits, safety-moving pictures, plant publications, etc. Safety can be sold to the employee group if they are contacted frequently regarding the safety of their particular operations.

Another source of stimulant is through the suggestion system. Employees are encouraged to submit ideas for elimination of potential hazards and are generously rewarded if their suggestions are accepted and placed in practical use.

The program outlined above is typical of the safety program in

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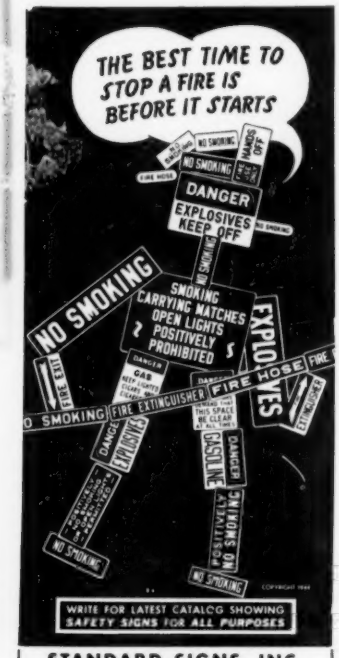
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operation in General Motors plants. While the programs in effect in the various plants may differ in detail with one another, they all follow the same general plan and the same six general principles.

In emphasizing the importance of management's responsibility for safety, it might be pointed out that in General Motors the management organization is held just as much responsible for the safe and healthful operation of the plants as it is for sales, engineering, production and purchasing. We have found from experience that this important responsibility cannot be delegated to others. Neither can it be diluted by joint committee action.

It must be definitely assigned and met.

However, just as any of management's responsibilities cannot be met without the cooperation of employees, neither can its responsibility for safety, nor can any safety program, succeed without the wholehearted cooperation of all employees.

Industrial Recreation Conference at Purdue

PLANS are underway for the fifth annual Industrial Recreation Conference which will be held at Purdue University, February 16 to 18, 1950. The Conference is sponsored by the University's Division of Education and Applied Psychology and the Technical Extension Division. Cooperating organizations include the Greater Lafayette Industrial-Commercial Recreating Council, the Indiana State Chamber of Commerce, the Indiana State Personnel Association, the National Industrial Recreation Association, and the Purdue Chapter of the American Recreation Society.

Special problems and the most recent developments in the organization and administration of industrial recreation programs will be discussed by outstanding leaders in the field. Each delegate will be afforded ample opportunity to present individual questions or problems.

For the most part, the Conference sessions will be conducted on a round table discussion period basis under competent, experienced leaders. Selected session subjects include: "Music in the Employee Recreation Program," "Recent Research Findings in Industrial Recreation," "Financing the Employee Recreation Program," "Organizing a City Industrial Recreation Council," "Elements of a Balanced Program," "Self-Improvement Suggestions for the Employee Recreation Director," and "Industrial Recreation Problems Clinic."

Representatives from industries, private and public agencies, and city recreation councils interested in a discussion of the latest developments in industrial recreation are invited to attend. Reservations may be made or information obtained by writing to: Industrial Recreation Conference, Technical Extension Division, Purdue University, Lafayette, Indiana.

Cotton Need Not Burn

(From page 15) finish require the addition of a solvent to aid penetration into the fabric and combustible solvents are most practical for this purpose.

Factory Application

The manufacturers of fire resistant textiles generally manufacture the finished fabric only and do not convert. All local fabricators of awnings, tarpaulins, truck covers, welding curtains, etc., can furnish these items manufactured from fire resistant materials providing the purchaser so specifies. All the testing agencies and government specifications referred to above are a dependable guide for purchasing fire resistant fabrics. Too much emphasis cannot be placed on requisitioning only approved materials, for the results can be disastrous indeed in the use of so-called fire resistant fabrics that are not proven to be safe. The purchaser in ordering fire resistant fabrics should not neglect to specify the product of a recognized manufacturer who can supply proof that his products conform to known specifications.

Cost of Flame Resistant Fabrics

The best flame resistant finishes are obviously more expensive than untreated goods. In most instances, however, this increase in cost is nominal as the base cost of the fabric, labor, cost of producing the fabricated article, etc., are not affected by the additional treatment.

Fire Marshal R. C. Roberts and Capt. R. A. Warfield of the District of Columbia Fire Dept. testing side wall of the Ringling's fire resistant big top.

A few dollars invested in a flame repellent fabric may save many times its original cost and prove to be the most effective insurance obtainable.

One of the pioneers in the field of flame repellent finishes has, as the result of many years of research and development, produced products which have the approval of all the recognized testing agencies and meet all Federal, Army and Navy Specifications. These fire-repellent fabrics* are protected by basic patents controlling the use of chlorinated hydrocarbons in connection with metallic oxides.

A recent development of this manufacturer is the introduction of a vinyl coating. This vinyl coating preserves in every way the pliability and workability of the fabric. It offers a finish highly crock resistant, free from tackiness, extremely durable and in which the fire resistant qualities of the original process are retained. The

* The name of the product and its manufacturer can be obtained on inquiry to the Editor.

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vinyl coating extends the uses of heavy fabrics into fields where exceptionally smooth surfaces impervious to soil, stain, grease, oil, alcohol, etc., can be used to advantage. Further, these vinyls are available in a variety of pleasing colors and in several weights of fabrics for a multitude of uses. These finishes are highly abrasive resistant and will not crack or peel even in extremely low temperatures.

Pictures by courtesy of William E. Hooper & Sons Co.

Bring 'Em Back to Life

(From page 20) culation may be fatal.

The factor to keep in mind is the number of successive heart beats which occur during positive intrapulmonic pressure. Continuous pressure, or a high average pressure, makes filling of the heart more difficult. Even very slow cycling of an automatic positive-and-negative resuscitator may be deleterious. But at proper speed, an automatic resuscitator maintains positive pressure in the lungs only during a few heart beats, before it swops back to the negative phase. Filling of the heart is aided by the negative phase, and the effect of the positive and negative phases combined is actually to help the flow of circulation.

Emphasis above has been on resuscitators of the automatically-cycling, positive-and-negative type, since these are by far the most widely used and have been shown, in comparative studies, to provide the most effective form of artificial respiration. A few words should be said about other types and about certain manual methods.

Adjustable Pressure Resuscitators

Some resuscitators are adjustable as to pressures, speed, volume, or other matters, and there are types which are manually manipulated by a sort of trigger mechanism. Each of these variable features has advantages under certain circumstances. Lowered operating pressures, for instance, are more comfortable for a conscious person and would sometimes be desirable in transporting a polio patient to an iron lung or for certain hospital cases. These special instances, however, call for the judgment of a doctor or a highly-trained professional, and it is noteworthy that the adjustable machines are not in general approved by the A.M.A. for use in non-medical hands.

For emergency rescue work simplicity is the goal. Even in hospital use, set-pressure, automatic resuscitators far outnumber all other types, because they are so nearly

SAFETY ENGINEERING Salutes a Safety Idea for January

Safety With Ease

STORING a drum of thinner on the top rack in the paint storage room of the Westinghouse Electric Appliance Division plant in Mansfield, Ohio, is done easily and safely with a floor operated bridge crane and a movable ladder. Other safety features of this paint storage room are: 1. Use of vapor-proof electrical fittings and fixtures; 2. Use of spark-proof floors and tools; 3. Use of exhaust fans to maintain vapors below explosive mixtures at all times; 4. Use of spring-closing brass valves on drums where it is necessary to make withdrawals; 5. Use of drip pans under valves to prevent spread of thinner and fast evaporation. Such mechanical aids materially help in making safety practices a habit.

Photograph by courtesy of Westinghouse Electric Corp.

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New Products
Pages 65–66
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Page 67

fool-proof as well as effective.

The Eve rocking method has received some publicity as a rescue measure. This method calls for equipment and is slow to start; but it appears to have an excellent effect on the circulation. It can provide ample ventilation if the air passages are kept clear. Maintenance of air way, however, may be difficult when the patient is being rocked vigorously, and there is danger of stomach contents gravitating to the mouth and thence aspirating to the lungs.

Editor's Note:
Reports received indicate that the Eve method is recommended by the U. S. Coast Guard, U. S. Navy, British Royal Navy, etc.

Manual Resuscitation Methods

Among manual methods, the Schaefer prone-pressure method, as taught by the Red Cross, is most widely used and has a record of saving many lives. It has been criticized recently on the grounds of inadequate ventilation, a criticism that is particularly justified if the patient is on a yielding surface (mattress) or is in such advanced asphyxia that the chest wall has lost all resiliency. The Schaefer method, however, can be applied by a single rescuer, employs a face-down position which gives the best chance of a naturally clear air way, and is well known.

The Sylvester method tends to give better ventilation, but is more difficult to apply and is said to involve more risk of injury.

Pole-top resuscitation, as now widely taught by utility companies, is an excellent method, already credited with many lives saved. Gravity helps in this method by drawing the diaphragm down to cause a positive inspiration (unlike the Schaefer method where only expiration is positive).

A method recently proposed by John H. Emerson also makes use of gravity to get air into the lungs. The patient lies prone as for the Schaefer method. The rescuer places his hands under the hip bones and lifts up several inches; then, after a moment, lowers. A strap or piece of cloth passed under the patient's hips at the point where he naturally bends may also be used, to make lifting easy. This method gives a surprising amount of ventilation.

In conclusion, the following general rules should be helpful: Start artificial respiration by some method at the earliest moment the non-breathing person can be reached. (Move from the danger zone, if gas hazards are still present.) Check the patient's air way (without stopping respiration) to make certain that breath can actually get to the lungs and is doing so. When a resuscitator is brought and is ready, change to it without the loss of a single breath. Keep the patient warm, but give no stimulants. Have a doctor called. Do not give up.

Picture by courtesy of the J. H. Emerson Co.

Editor's Note: A bibliography of articles on resuscitation in medical publications (some of them referred to above) is obtainable on request from the J. H. Emerson Company, 22 Cottage Park Avenue, Cambridge, Massachusetts.

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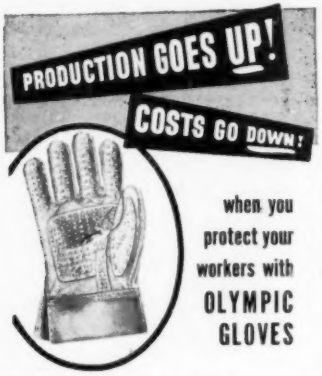
Sixteenth Annual Philadelphia Regional Safety Conference and Exhibit, March 7–8. (Bellevue-Stratford Hotel). Walter W. Matthews, managing director, Philadelphia Safety Conference, N. E. Cor. 17th & Sansom Sts., Philadelphia 3, Pa.

Miami Beach, Fla.

National Society for the Prevention of Blindness Conference, March 26–30. (Floridian Hotel). National Society for the Prevention of Blindness, 1790 Broadway, New York 19, N. Y.



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Twentieth Annual Safety Convention & Exposition, March 28–31. (Hotel Statler). Paul F. Stricker, Executive Vice-President, Greater New York Safety Council, 60 E. 42nd St., New York 17, N. Y.

Columbus, Ohio

Twentieth All Ohio Safety Congress and Exhibit, April 11–13. (Neil House). James H. Fluker, congress chairman; G. S. Kallenbaugh, congress manager, 65 S. Front St., Columbus 15, Ohio.

Buffalo, N. Y.

Tenth Western New York Safety Conference and Exhibit, April 12–13. (Hotel Statler.)

St. Louis, Mo.

Central States Safety Conference, April 18–20. (Hotel Jefferson). Reyburn Hoffman, Secretary-Manager, Safety Council of Greater St. Louis, 511 Locust St., St. Louis, Mo.

Chicago, Ill.

Thirty-fifth Annual Convention of American Association of Industrial Physicians and Surgeons, April 23–29. (Hotel Sherman). Dr. Edward C. Holmblad, 28 E. Jackson Blvd., Chicago 4, Ill.

Toronto, Ont.

Annual Convention International Accident Prevention Associations, April 24–25. (Royal York Hotel). R. B. Morley, General Manager, International Accident Prevention Associations, Toronto 2, Ont.

Chicago, Ill.

Twenty-seventh Annual Midwest Safety Show, May 2–4. (Hotel Sherman). Joseph F. Steeh, Manager, Greater Chicago Safety Council, 10 N. Clark St., Chicago 2, Ill.

Pittsburgh, Pa.

Twenty-fifth Annual Western Pennsylvania Safety Engineering Conference, May 2–4. (William Penn Hotel). H. H. Brainerd, Executive Manager, Western Pennsylvania Safety Council, Chamber of Commerce Bldg., Pittsburgh 19, Pa.

Charlotte, N.C.

Twentieth Annual North Carolina Statewide Industrial Safety Conference, May 3–5. (Hotel Charlotte). H. S. Baucom, Safety Director, North Carolina Industrial Commission, Raleigh, N. C.

Detroit, Mich.

Twentieth Annual Michigan Safety Conference and Exhibit, May 15–18. (Book Cadillac Hotel). S. M. Foeller, executive secretary, Michigan Consolidated Gas Co., 415 Clifford, Detroit 26, Mich.

Washington, D. C.

President's Conference on Industrial Safety, June 5–7. (Dept. of Labor Auditorium.) Secretary of Labor Maurice J. Tobin, general chairman of the conference.

Baltimore, Md.

Maryland State-Wide Safety-Health Conference and Exhibit, June 7–8. (Lord Baltimore Hotel.) Joseph A. Haller, executive chairman, State Industrial Accident Commission, Equitable Bldg., Baltimore 2, Md.

Boise, Idaho

Western Safety Conference, June 18–20. L. M. McKay, Vice-President, Western Safety Conference, P.O. Box 1038, Boise, Idaho.

New Products—Pages 65–66

AEC Announces New Training School

ADVANCED training in the field of reactor development will be given government and industrial scientists and engineers at a newly established Atomic Energy Commission Reactor Development Training School at the Oak Ridge National Laboratory.

The emphasis on the new school will be to supply as quickly as possible scientists and engineers with formal training in reactor development. The students will fall into three categories:

a. Engineers from industrial organizations who will remain on their companies' payrolls while attending the training school.

b. Employees of other atomic energy laboratories or other government agencies detailed to Oak Ridge for training.

c. Recent college graduates hired by Oak Ridge National Laboratory who will be trained as regular employees and will then be available for transfer to reactor groups throughout the atomic energy program.

Present plans call for about 60 students to be trained at one time, about 30 students in categories *a* and *b* and an additional 30 in category *c*. The school will operate continuously. All students will be required to have complete security investigation and clearance and the lectures and study material will be classified. Selection will be made by the Commission from qualified applicants on the basis of the need of the organization with whom its applicant is affiliated for personnel trained in reactor development, its potential contribution of the applicant to the AEC programs, and his academic record.

The shortage of trained men in the reactor development field has seriously hampered the national program for design and construction of new types of nuclear reactors. Reactors are the machines used for production of atomic energy and materials for atomic weapons.

Industrial participation is an important part of the training program since many American industrial concerns are working under AEC contracts on one or more phases of reactor development. In addition, many industrial companies of potential value to the national reactor development program have been unable to undertake work in the field because of their lack of men with the necessary training.

Plans for industrial participation are in accord with proposals made to the Commission by professional and engineering groups to provide opportunities for selected industrial organizations to send working-level engineers to atomic energy installations for firsthand experience and training.

The Oak Ridge National Laboratory is well located for such a training school. The Laboratory has also had considerable experience in operating training schools. In 1946–47 the Oak Ridge Training School—dubbed "The Clinch College of Nuclear Knowledge"—was run to provide postdoctorate training in the theoretical aspects of the nuclear sciences. Currently the Laboratory is operating an educational program in reactor physics and reactor technology for its own employees.

Dr. F. C. Von der Lage, former director of the training division of the Oak Ridge National Laboratory has been named director of the Reactor Development Training School.

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Page Sixty-Seven Has Some Nifty Free Bulletins & Catalogs For 1950

industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

Treatment for "Miner's Asthma"

JUDGED the best scientific exhibit at the 1949 Pennsylvania State Medical Society Convention held recently in Pittsburgh, was this display demonstrating a new treatment for anthracosilicosis, the dreaded "miner's asthma." The treatment, developed at Barton Memorial Division of Jefferson Medical College Hospital, Philadelphia, has been highly effective in providing relief for miners suffering with the disease, according to Dr. Burgess Gordon and Dr. Hurley L. Motley who are in charge of the project. The research is financed by the Anthracite Welfare Fund. Key factor in the treatment is a double-acting cycling valve that helps force oxygen and drugs into the lungs of the victims. Treatment centers making use of the new technique have been established at several locations in coal-mining areas. It was pointed out the treatment is not a cure for the disease but does bring relief. In some cases it has enabled previously disabled miners to take some type of employment. The display also was exhibited at the annual meeting of the Industrial Hygiene Foundation at Mellon Institute, Pittsburgh, November 16 through 18.

Picture by courtesy of Mine Safety Appliances Co.

Air Pollution Standards

ALTHOUGH industrial hygiene experts have made remarkable progress in controlling air pollution in factories and entire plant areas, a number of problems still need to be solved by research, according to Frank A. Patty of General Motors Research Laboratories.

Mr. Patty, head of the GM Research Industrial Hygiene Department, outlined some of these problems in an article, "Air Contamination Standards," for the quarterly journal, "Standards World."

In tackling air contamination both inside and outside industrial plants, hygienists and toxicologists are confronted with:

1. Insufficient data on physiological effects continued exposure to contaminants has on human beings.
2. Lack of standards or "benchmarks" for permissible concentrations of air contamination—concentrations actually safe for human beings.
3. Fear that "unnecessarily severe and impractical limits" will be set for controlling air contaminants.
4. Conflicting viewpoints of experts on the subject, because much about air contamination is still unknown.

These problems, he explained, still confront experts after more than 10 years of study by a committee of

the American Standards Association.

Mr. Patty believes hygienic limits "are desirable and they should be set without undue delay for materials . . . in industry" that might be harmful to workers. Such benchmarks or limits have long been established throughout GM operations. They comply with recommendations of the U. S. Public Health Service and other governmental agencies.

He also advocates "bases" for air pollution control standards. These bases, he explained, might be governed by the physiologieal responses of man and animals to various air contaminants, sensory or "comfort" limits, good engineering practice and fire and explosion control.

Plant managers and engineers "must have some sort of milestone to differentiate between safe and unsafe or good and bad practice," he wrote.

Such a standard must be based on "all factors such as health, safe practice, engineering, practicability, economic possibilities and employee satisfaction," he said. This, he contended, would be better than a benchmark stemming from "offhand estimations by single groups or individuals, and sometimes from biased or unqualified sources."

"The permissible concentration of material is one factor to be considered when selecting products for use in industry. The plant or maintenance engineer must have a basis for calculating his ventilation so that all interested parties have a common ground for reaching accord," Mr. Patty wrote.

One objection to such benchmarks, he pointed out, would be the possibility of fixing them in legal codes "instead of leaving them flexible . . . to fit the accumulation of knowledge upon which to revise the tentative standards." Such legal codes, he said, could react to the disadvantage of the plant worker rather than to his advantage.

Mr. Patty explained that not all contaminants can be standardized as to their physiological effects on plant workers. He added that "nutrition is a very important factor in health maintenance and therefore must have a tremendously important influence on the physiological effect of atmospheric contaminants" in an industrial plant.

"The defensive effects of diet have been inadequately studied and the part that nutrition may play in fixing hygienic standards of air contamination is, as yet, essentially a closed book," Mr. Patty wrote.

"We may never be able to establish positively safe limits of contamination for toxic materials applying to all persons at all times and yet have the limits compatible with good industrial and engineering practice.

"No matter how carefully our standards are established, if they are maintained at a level compatible with industrial survival, there may be an occasional case of illness in the especially susceptible individual.

"We perhaps should be content to make industrial disease a rare and reversible condition rather than attempt the improbable goal *(Continued page 61)*

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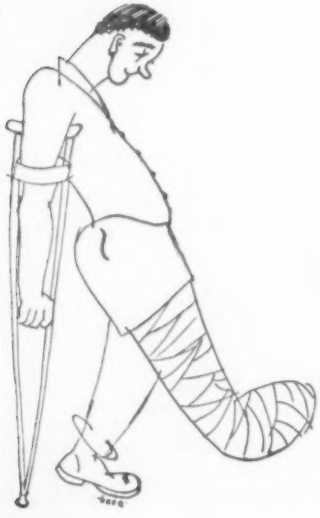
SCRAP RUBBER FIRE

SCRAP rubber was being moved by a gasoline engine driven yard crane at a large rubber plant. A hot carbon spark from a defective exhaust manifold set fire to the rubber. The operator discovered it promptly and used an extinguisher, but the flames spread rapidly, so that the plant brigade and city firemen had to use nine hose streams before all fire was finally extinguished. The crane was damaged and much scrap rubber destroyed.

The exhaust was not equipped with a muffler, and a screen on the exhaust had corroded off and had not been replaced. The experience is another illustration of the need of good supervision and maintenance of equipment to prevent ignition sources.



PASSING HAZARD

EMPLOYEE was driving a panel truck along the highway. He pulled to the left side of the road to pass a slow-moving car and collided with the lumber truck coming on highway toward him.

This accident was caused by employee's failure to observe safe driving precautions, inasmuch as he was driving on the wrong side of the road when the accident occurred.

HORSEPLAY

WHILE most sensible people will admit that horseplay on the job is dangerous to everybody, every now and then there are workers who will indulge. One worker tossed a ball to another worker, who struck it with a tool handle, whence it came right back to hit the original tosser in the eye. He spent several weeks in the hospital waiting for that eye to heal.

RUBBER CEMENT IGNITED

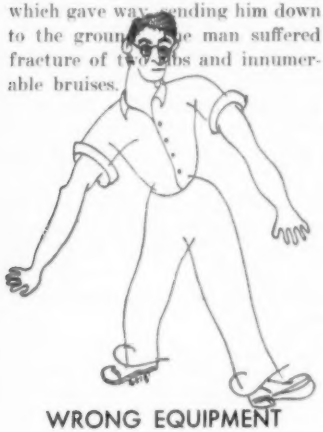
AN EMPLOYEE carried an uncovered pail of rubber cement near a burner bench at a medical goods manufacturing plant. When he paused to converse with another employee, the exhaust duct above the burner drew the solvent fumes, and they were ignited by the gas burners. He dropped and overturned the pail, spreading the fire. One sprinkler opened, though employees extinguished the fire with carbon dioxide units. The fire was out when the public fire department arrived. A large quantity of goods in process was destroyed by water and the interruption to production.

Processes involving open flames are always dangerous where flammable vapors may be present. Use safety containers for flammable liquids.

HARD WAY

BROKEN RUNG

THE importance of ladder maintenance is frequently illustrated by a serious accident resulting in long injury. While ascending a ladder to do repair work, a worker stepped on a broken rung which gave way, sending him down to the ground. The man suffered fracture of two ribs and innumerable bruises.



WRONG EQUIPMENT

ABOUT to scrub the floor of distillation structure, an employee stood on sidewalk, wet and muddy from recent rains, holding an eight-gallon bucket of very hot water by bail and bottom. As he moved forward to throw the water on the floor 10 inches higher than the sidewalk, his right foot slipped. The bucket broke free of his left hand and swung forward. When the bottom hit the structure, the bucket tilted backwards in the direction of employee, spilling hot contents on his right foot.

Equipment for this type of work should be specified and be in good condition. Source of hot water not above 150 degrees F. for cleaning purposes.

ESCAPING GASOLINE

WHEN the employee lit a blow-torch, there was a burst of flame which burnt his hands severely. Investigation showed that a plug at the bottom of the torch's blow-pipe had loosened and allowed gasoline to escape. This is the sort of thing that takes only a minute to check and make sure everything is in proper order.

EYE INFECTION

THE left eye of an employee began to burn and pain him severely after traveling to work in a gang cab. Windborne dust and trash in truck carried a metal particle which entered employee's eyes. Scratched eyeball did not receive immediate attention, and eye became infected.

Cabs should be kept as clean as practicable. Injuries should receive immediate treatment.

USE YOUR EYES

THE best safety equipment in existence is useless if the men using it don't keep alert. Recently an employee was climbing into the bed of a pick-up truck. He was looking back over his shoulder speaking to his foreman, and stumbled over tools placed in the truck. One rib was fractured.

BROKEN WINDSHIELD CUTS

SERVICE-STATION attendant suffered a laceration of the palm of his hand which required two stitches when, while wiping the windshield of a customer's car, his hand was cut by windshield glass.

The windshield had previously been broken. A piece of tape, used to repair the break, was pierced in the wiping operation.

Attendants should be especially careful to avoid cutting themselves on windshields repaired in this manner.

Hazards of Non-Siliceous Dusts

By DR. LOUIS M. WIENER,
Plant Medical Director
Morganite Incorporated
Long Island City, N. Y.

Many so-called "inert dusts" are now recognized as having adverse effects on the respiratory system.

OUR knowledge of the hazards of the non-siliceous dusts has been growing rapidly and a considerable literature now exists on this subject. The term "inert dusts" may disappear from industrial medical literature to be replaced by accumulating evidence that many such dusts produce specific effects, almost always involving the respiratory system. As early as 1818, a Dr. J. Jackson, in our country, suggested that cotton dusts were capable of producing chronic lung disease, although it was not until 1940 that such causal relationship was recognized as a compensable illness in Great Britain. In 1870, a special British Health Commission studied the effects of the non-siliceous dusts on the health of the workers employed in dusty environments and made recommendations as to the control in such areas. In 1930, the U. S. Bureau of Mines in an information circular, summarized all existing knowledge of these dusts, and since then has printed additions uncovered by case findings.

The Respiratory System

To understand the production of disease by dusts, a knowledge of the anatomy, physiology, and pathology of the respiratory system is necessary. The nose, trachea, and main bronchial passages constitute a natural "air conditioning" unit—these tubes are lined by a ciliated coat and lubricated by a mucous gland secretion whose purpose is (1) to warm and moisten inhaled air (2) to filter and protect against foreign particles (3) to propel such particles towards the pharynx where they may be coughed up or swallowed. Exposure of this protective system to a dusty environment leads to diminished cilial activity and depressed mucous secretions so that bacterial invasion, pulmonary congestion, and granulomatous parenchymal dust deposits are facilitated. Cough, breathlessness, and cyanosis are the usual signs and symptoms of such morbidity. The pathology results because of foreign body invasion of interlobar septa and alveolar walls from the bronchial tree. Congestion is early and scar tissue formation soon appears which, in turn, leads to formation of areas of emphysema. When these emphysematous blebs are peripheral and rupture occurs, pneumothorax is a result. This process has been aptly termed "granulomatous pneumonitis" by Gardner. X-ray studies reveal a lacy infiltration of the lung which may become heavy enough to produce the "snow storm" appearance.

The known dust hazards may be classified as follows:

1. Cutting Dusts: abrasives, such as alumina dusts.
2. Irritant Dusts: acid and alkali impregnated dusts, wood, textiles, ivory, sugar cane, wool, cotton, silk, and beryllium.
3. Inorganic Poisonous: usually arsenical impregnated, pigments.
4. Obstructive: carbon, rouge, flour.

Irritant Dusts

There are innumerable industries where acid and alkali impregnated materials are ground into various shapes and sizes—carbon, copper and other metals, plastics, etc. Irritation and finally ulceration of the tracheo-bronchial tree may occur with massive hemoptysis. Our plant had one such case. A grinder who had been "sizing" acid-impregnated graphite blocks had a severe hemoptysis some four hours after quitting time. He was bronchoscoped during his hospitalization and an ulcerated area 1 x ¼ km. was found in the right main bronchus immediately below the bifurcation. No other pathology was found.

Workers in planing and woodworking mills quite frequently complain of a "chronic catarrh." Bergman, Rukstinat, and McNally investigated this problem and found that tuberculosis morbidity and mortality was about twice that found in worker population engaged in non-dusty production. They exposed rabbits to various wood dusts in a concentration of 6–10 million particles per cubic foot of air and observed these animals over a thirty month period. A survival

rate of 40% was found. The animals revealed a hemorrhagic bronchopneumonia with scattered abscesses through the pulmonary parenchyma; all the nasal passages and upper respiratory tract contained sawdust. The authors feel that similar dust concentrations would and probably do affect humans.

Textile dusts, especially cotton and wool, have been the source of numerous articles in industrial medical literature. From carding tables and factories all over the world—Australia, Egypt, India, Great Britain, and the United States—there has been a steady stream of sick workers bearing a specific symptomatology to which the name of "Byssinosis" has been given. Morbidity is high and is characterized by the appearance of fever and chronic cough, weight loss, and anorexia. These symptoms are also present in the other types of granulomatous pneumonitis. Recently, Ritter et al. have published a paper on their studies and have concluded that byssinosis is an allergic rather than a specific granulomatosis. Whatever may be the specific pathology, nevertheless a problem exists and control is indicated.

Bagassosis is the name given to the specific illness resulting from exposure to the sugar cane residue, bagasse. It is an illness endemic in Louisiana but is spreading as a result of greater industrial use of bagasse in the insulating *(Continued on page 64)*

Air Pollution Standards

(Continued from page 57) of complete eradication," Mr. Patty wrote. "Physiological effects must not be confined to permanent injury but should include nausea and other real signs of distress."

The article said standards for outdoor atmospheric pollution are "infinitely harder to fix than . . . indoor standards."

In this connection GM has an extensive "air cleaner" program under way, with dust suppressors on cupola (melting furnace) smokestacks of foundries. These keep dirt and obnoxious gases from escaping into the air from foundry stacks.

"From the toxicological viewpoint obviously the concentration of a contaminant that may be encountered up to 24 hours per day must be considerably less than one encountered only during a work day," Mr. Patty said. "But out-of-door contamination is largely offensive to taste, sight or odor sense rather than demonstrably injurious to health.

"The fastidious person might complain about a hazy atmosphere or a slight odor from some industrial operation and seek air that compares with country air, whereas his neighbor might be immune to the haze or odor and prefer to live near the plant that is offensive to the first person."

Mr. Patty added that because so little is known about outdoor air pollution, benchmarks or standards should cover only local areas, until enough data is collected to justify national standards.

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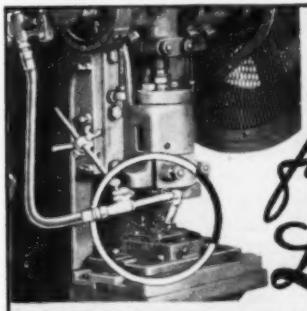

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THE INDUSTRIAL Nurse

EDITOR

ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Industrial Hygiene Proposals

A CONFERENCE group representing management, labor, research groups, physicians, nurses and state governmental agencies has drawn up a set of recommendations for the consideration of the U. S. Public Health Service. They are, in summary, as follows: 1—An agreement should be reached giving full recognition to the proper function of the Federal and State Labor departments in the enforcement of laws, codes, and regulations affecting the safety, health, and well-being of workers in industry; 2—The introduction of ionizing radiation in industry carries with it new and virtually unknown hazards to the health of workers employed in such industries. Greater dissemination of available information should follow, and research by federal and state agencies as well as by qualified universities should be undertaken in this area; 3—Basic research establishing criteria for various toxic substances in connection with atmospheric pollution should be made a part of the industrial hygiene service of the U. S. Public Health Service; 4—A study should be made of all industrial medical care programs, with evaluation of costs, and types of service rendered; 5—A more adequate plan of reporting occupational diseases should be developed; 6—New techniques need to be developed to meet the industrial hygiene needs of small plants; 7—Federal funds should be obtained for research and pilot studies intended to develop mental hygiene facilities in industry; 8—A study should be made of medical certification of temporary occupational and non-occupational disability among industrial workers. These proposals are indicative of the current thought of leaders in the field of industrial hygiene. They deserve careful study.

Psychopathic Personalities

SUCH personalities represent one of the most difficult industrial problems. This group includes individuals who are often of high intelligence and in many ways extremely capable. However, because of their personality make-up, they are frequently unable to get along with others; they are inclined to be egocentric, irritable, suspicious and childish. They do not fit well in an organization and have difficulty working with others. They do not have a psychosis, they are not legally insane, and they cannot be committed to mental hospitals for treatment. Yet many of them are as badly adjusted and as unable to fit into society as cases of frank psychosis. Frequently little, if anything, can be done with the pronounced cases of psychopathic personality. Occasionally there may be jobs where such an individual works more or less alone and can avoid difficulties of adjusting with others. They are extremely difficult to deal with. At group meetings they may give distinct evidence of being markedly self-centered and suspicious not only of fellow workers, but more particularly of foremen, superintendents and other direct representatives of the employer. In unionized industries, they may be among the first to bring charges against the employer, to scrap with union delegates, to try to stir up fellow workers into some overt action such as a slow-down, or even a strike. It is desirable to recognize such individuals for what they are, even though it may not always be possible to dismiss them. As indicated, sometimes a change of occupation or assignment may help relieve a disturbing situation.

Interpersonal Factors in Illness

IN THE experience of some physicians, it has been found that most patients regress in some degree to infantile attitudes, placing the physician in the position of a parent or nurse, from whom the utmost of care is demanded, but whom, on the other hand, it seems to be diverting to trick or annoy. The physician or the person who assumes responsibility for the patient's cure, steps into a parental role, usually that of the father, and is unconsciously regarded as such

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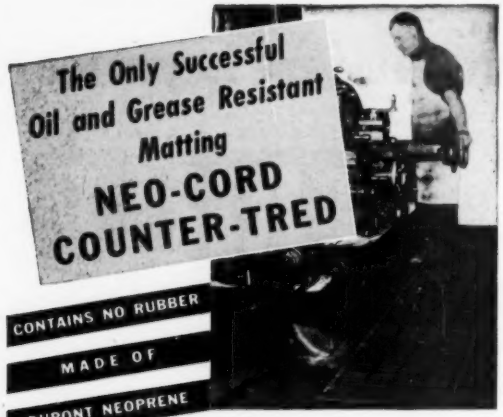
by the patient. Emotions felt by the patient for his own father are assumed to be ambivalent, in which case the physician is regarded with admiration, trust and affection as a good father who will heal him, and on the other hand, with fear and hatred, as a possibly bad punitive parent. The patient's feeling toward the nurse is usually akin to that felt for a mother or sister, and may vary a good deal between male and female patients. Women usually are more critical, demanding and resentful of nurses' authority, though it has been found that some men patients will transfer to nurses their resentment against domineering mothers. In summary, it may be noted that these psychologic interpretations lead to the following conclusions: 1—Many patients show psychologic regression to a greater or lesser degree; 2—The patient's reaction to the physician, the nurses, to fellow patients and to his family are largely due to unconscious factors derived from early life; and 3—The effects of these unconscious factors on the relations between the patient and the people in his immediate environment are reciprocal interactions. An understanding of these interpersonal factors in illness, even among ambulant patients, may help to explain some odd conduct and difficulties encountered with certain categories of patients.

Disability Insurance

DISABILITY insurance laws, first enacted in Rhode Island, in May, 1942, are now also in effect in California, New Jersey and New York. The Rhode Island law established an exclusive state cash sickness fund. It is based on employee contributions entirely and started with a one percent tax on wages up to $3,000 per year. Workers in Rhode Island had previously paid one and a half percent of their wages to the unemployment compensation fund. The institution of the sickness benefit plan meant no additional financial burden for covered workers, but provided an additional type of benefits financed by taking two thirds of the tax paid by the workers and formerly devoted exclusively to unemployment benefits. Sickness benefits were fixed at the same scale as unemployment benefits. In 1946 California amended its Unemployment Insurance Act to provide disability insurance benefits under a system which includes a state fund and the right to "contract out" by means of approved voluntary plans. No additional taxation was required. The state disability insurance fund is financed out of a one percent employee contribution which previously had been paid into the unemployment insurance fund. The New Jersey Temporary Benefits Law was enacted in 1948. The law provides for a state disability benefit fund with merit-rating features and provisions for contracting out. The plan is financed by a one percent tax on covered payrolls. Employees contribute three fourths of one percent, which is in part a diversion from the unemployment compensation fund. In April, 1949 a similar type of legislation was enacted in New York. Legislative proposals in this area of insurance have also been made in Illinois, Massachusetts, Montana, New Hampshire and Washington. There is apparently a trend for the expansion of this type of insurance. Its current provisions and new proposals warrant study by the industrial nurses and those concerned with the health and safety of workers.

Statistics on Heart Disease

EXTENSIVE studies have been made by the U. S. Public Health Service on the incidence of diseases of the heart. Some of the findings are of prime concern to industry. Heart disease, the largest single category in the cardiovascular-renal diseases, is by far the most frequent of all causes of death. Hypertensia and arteriosclerosis rank low as recorded primary causes of death in the United States, but intracranial lesions of vascular origin, usually preceded by hypertension or arteriosclerosis or both, are important causes of death. Nephritis in terms of numbers of deaths is roughly equivalent to intracranial lesions. The three causes combined under the general title of cardiovascular-renal diseases, made up 48 per cent of all deaths in the United States in the years 1945–1946. These causes accounted for 10 percent of all deaths at 15–24 years; 30 percent at 35–44; 52 percent at



Long wearing under heaviest traffic, the slip-resistant qualities actually improve with use.
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Reduces fatigue, speeds up production.
Reduces breakage.
Combines Gro-Cord, exclusive cord-on-end construction with Dupont Neoprene to provide the world's greatest non-slip material. The cords are the identical high grade native long staple sea island cotton such as employed in the manufacture of finest tires. Ridges on the top and bottom faces afford a safe walking area, drainage and aeration.
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55–64 and 66 percent at 75–84 years of age. Thus in the older ages they constitute a very large proportion of the deaths from all causes. At least three criteria measure the importance of a given disease as a cause of morbidity—annual cases or attacks per 1,000 persons observed, annual days of disability per person observed, and days of disability per sick person. In terms of cases or attacks of illness, both disabling and non-disabling, the cardiovascular-renal diseases are outstripped by the acute upper respiratory diseases. However, in terms of days of disability per sick person, the cardiovascular-renal diseases rank high because of long durations.

Hazards of Non-Siliceous Dusts

(From page 61) material and brick industries. Bagasse is composed of cellulose, lignin, and insignificant amounts of silica. Inhalation of this dust produces a delayed pulmonary disorder characterized by an insidious onset of fever and leucocytosis with an abrupt ushering in of cough and dyspnea. Roentgen examinations reveal consolidations of varying sizes in the hilar regions; resolution usually occurs about two months after the height of infiltration has been reached. Recent research has disclosed that autoclaved bagasse fails to produce pneumonic pathology in experimental animals after suitable exposure. It is thought that perhaps fungi present in the residue are the specific agents of disease.

Shaver and Riddell have recently reported on another type of dust hazard, namely alumina abrasive. They have found numerous cases of pulmonary disease in workers employed in plants processing bauxite and have reported on 43 such cases. Cough, dyspnea, and occasionally pneumothorax are the outstanding signs and symptoms; affected workers demonstrate limited chest expansion and harsh breath sounds. The X-ray examination often reveals a lacy infiltration—this is also a pathognomonic sign of granulomatous pneumonitis.

Beryllium Dust

Beryllium dust is a newcomer in the field of industrial hazards; this metal is used in fluorescent powders and in copper fabricating plants. In most of the reports, emphasis has been placed on the insidious onset of illness after exposure to beryllium dusts. The prominent symptoms are anorexia, weight loss, dyspnea, and persistent non-productive cough. The fatality rate is high! Autopsy has revealed a diffuse pulmonary parenchymal cellular infiltration with thickened alveolar walls in which a prominent vascular engorgement was found—in long standing cases, a diffuse fibrosis of the lungs was evident. The X-ray films usually revealed a fine, diffuse granularity followed by a nodular pneumonitis, presenting the so-called "snow storm" appearance.

The heavy publicity of the "smog deaths" in Pennsylvania emphasized the hazards of the metal fumes. Zinc oxide, copper oxide, magnesium oxide, sulphur oxides and others which are used or are a result of industrial manufacture produce illness, usually pulmonary disease, in affected workers. The onset of illness is rapid, 2–8 hours after exposure, and is manifested by chills and fever, leucocytosis, cough, and dyspnea. It is thought that the pathology is the result of absorption of altered protein material formed by the action of the heavy metal on the respiratory tissue.

There is great enough morbidity now to warrant the same degree of control we exercise in mines and industrial plants fabricating silica products. Public health authorities, management, and labor should get together and draft a code for working conditions whose goal should be the eradication of all dust hazards. This can be achieved by (1) defining a safe working environment—certainly, one which compares favorably with the dust concentration in the outside environment (2) installing adequate exhaust systems over or incorporated into working machinery (3) providing workers with adequate respirator devices. Public health authorities and insurance agencies should expand investigating facilities for determination of dust concentrations in working areas. In this manner we can be assured that all known and potential hazards will be controlled or eliminated.

NEW PRODUCTS

For illustrated descriptive literature of products listed in this section readers may apply

TO SERVICE DEPT., SAFETY ENGINEERING MAGAZINE

"TRUWOOD" VENEER RESISTS FIRE, ACIDS, SCRATCHING

NEW horizons for the use of wood in building construction and decoration, product design, and manufacturing have been opened by the Fox Bros. Mfg. Co. of Missouri with the combination of Westinghouse "Truwood" veneer and Protexol-impregnated plywood. The new "Truwood" by Fox Bros. has a lifetime beautifully finished surface that is resistant to fire, acids, rot, vermin, scratching and staining. "Truwood" has been applied to a resin-bounded plywood base that has been made dimensionally stable.

Under rigid tests "Truwood" successfully withstood all common burn tests. According to the manufacturers it resists abrasive action, and will not scratch even when sharp instruments are applied to it under heavy pressure. The resin-bounded base to which "Truwood" is laminated, is built up of thin plies—Protexol-impregnated under Standards of the National Board of Fire Underwriters. As the emphasis on fire protection in construction increases, and the amount of combustible materials permitted in public places is constantly reduced, this new "Truwood" combination by Fox Brothers offers the answer that architects and builders have wanted—for beauty *plus* safety.

For manufacturers and designers who are interested in adapting "Truwood" veneer and Protexol-impregnated lumber to their uses, Fox Brothers is furnishing the new combination in bulk sizes up to four feet by eight feet panels in any thickness of base desired; also in millwork custom-built to any specification. For details send in the coupon.

AUTOMATIC EMERGENCY LIGHT

THE 1950 model MINUTEMAN Automatic Emergency Light is being offered by Carpenter Mfg. Company, Somerville, Mass. and its national distributor, Electric Cord Company, New York.

The MINUTEMAN is an entirely self-contained unit and is semi-portable. It may be plugged into any convenient outlet or permanently connected to the lighting circuit. Twin floodlights, with fully adjustable mounting, light up instantly and automatically when usual current fails.

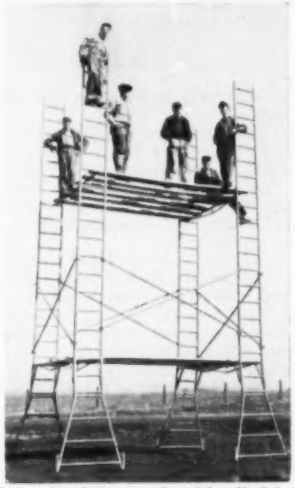
Emergency power is furnished by a storage battery specially designed to provide adequate illumination over an area of more than 10,000 square feet for a minimum of 4 hours. A fast charger restores

the battery quickly after an emergency and an automatic trickle charger fully maintains the charge.

The MINUTEMAN is of sturdy construction and is attractively finished in a neutral tone baked enamel. Lamp heads may be detached and mounted away from the unit if desired. Additional lamp heads are also available for remote mounting. The MINUTEMAN is approved by Underwriters' Laboratories and is fully guaranteed by the Manufacturer. Batteries carry the standard guarantee of Willard Storage Battery Company. For full details, send in the coupon.

ADJUSTABLE WORK PLATFORM

SHOWN here is a new type of work platform, adjustable to any height, recently introduced by Bil-Jax, Inc. of Ohio.



Made of tubular steel, with all joints electrically welded, the equipment offers great safety, plus flexibility in its application to almost any off-the-ground job, inside or outside, and requires less material than most methods, according to the maker. It is available with or without rubber tired casters which lock into fixed position. Basic individual parts can be quickly assembled into a complete unit of any desired height with rigidity and safety. The same standard sections are used on practically all installations.

The Bil-Jax firm also has introduced a line of steel scaffolding, lean-to ladders, maintenance trestles with adjustable scaffold horses and ladder jacks—all of tubular steel. Additional information may be had by sending in the coupon.

WELDING MASK

UNOBSTRUCTED vision feature of improved Mask for Gas Welding. Jackson's type BX Shield is especially designed for gas welding, cutting and brazing. This model has been improved in many respects, multiple adjustment assures proper fit. May be worn over prescription glasses. Available for immediate shipment from General Scientific Equipment Co.

Headgear and cross strap over top of head are made entirely of extruded plastic. They are moisture proof, will not

shrink or warp, and may be thoroughly sterilized.

Adjustable in circumference and height to give exact and lasting fit. Genuine leather sweatband assures added comfort.

New headgear pivot assembly is semi-permanent. Tension is locked in at the factory. No washers or nuts to back off and get lost.

Sturdy side protectors hold pivoted lens retainer, made of durable opaque molded plastic. Standard size 2" x 4¼". Lenses are held securely in place, yet easily replaced. Available in Federal Specification shades from 3 through 6.

Send the coupon today for complete information.

NEUTRAL ICE SOLVENT

A REVOLUTIONARY new neutral chemical, called SAIF, for ice and snow removal without damage to the finish of automobiles, was recently placed on the industrial market.

The new product, SAIF, is made of clean wood flakes impregnated with a chemical that is on balance between acid and alkaline reaction, and which is used for household or highway purposes as an ice solvent.

SAIF, according to the inventor, George B. Wagner, is a product of years of research and testing. He listed, among its many advantages that SAIF is neutral, non-corrosive, harmless to pavements, fabrics and to metals and their finishes—non-poisonous, and non-flammable.

Manufactured of plentiful, low-cost chemically-treated wood flakes, SAIF is economical to buy and use. Only 1/14th the weight of sand, it will treat 14 times as much street surface as its weight in sand.

The new product is already in volume production and being distributed in 50-lb. bags and in bulk to highway and street departments and industrial users.

Consumer packages will be available soon—two-lb. boxes, handy dispenser tubes of 1 lb. 14 oz., and 25 lb. bags, and will be available at hardware, drug, grocery, department and feed stores and at neighborhood gasoline stations. Send in the coupon.

January, 1950

To SAFETY ENGINEERING

75 Fulton St., New York 7, N. Y.

For prices and complete details of items mentioned in this month's "What's New in Safety Products," check items that interest you and mail coupon.

- ☐ Fire Resistant Veneer
- ☐ Automatic Emergency Light
- ☐ Adjustable Work Platform
- ☐ Welding Mask
- ☐ Neutral Ice Solvent
- ☐ Plug-In-Strip
- ☐ Wind Shield De-Icer
- ☐ Flashing Display

Firm Name .....

Attention of .....

Position .....

Firm Address .....

City .....

PLUG-IN STRIP

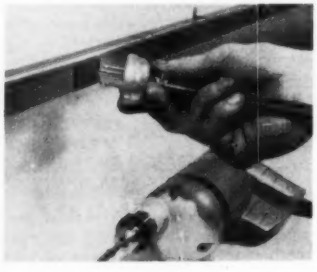
TO SUPPORT the increasing trend for grounded electrical systems, National Electric Products Corp., of Pennsylvania, is introducing a new Plug-In Strip with grounded receptacles.

In addition to providing a spread of electrical outlets at either 6 in. or 18 in. intervals, the new multi-outlet assembly offers industries, stores, institutions and home owners the opportunity of plugging-in grounded or ungrounded portable electrical equipment in every receptacle.

According to National Electric, the basic construction of Plug-In Strip has not been changed since its initial presentation a year ago. However, in addition to the conventional two slots in each receptacle, there is an adjacent third slot. Beneath this aperture is a copper insert that is securely mounted to the multi-outlet's steel base, affording a positive grounding facility.

This construction allows the use of a standard 2-blade plug, or the Series 5200 3-blade grounding plug, made by device manufacturers.

This new model Plug-In Strip which is approved by Underwriters' Laboratories, Inc., and is identified as Type CF2-G, has a 24 gauge steel channel enclosing the receptacle harness of 2 No. 12 insulated conductors. Use the coupon.



FOR SAFER WINTER DRIVING

DE-ICING fluid in non-breakable, flexible Bakelite polyethylene atomizer eliminates one hazard of winter driving by clearing sleet and frost from windshields and car windows for miles of safe driving. By squeezing the bottle with a pulsating action the liquid is forced out of the atomizer head in a fine spray. Both atomizer head and hinged cap are molded of the same plastic in a single piece, preventing loss of the cap or contents of the bottle. The fluid when sprayed on turns sleet or frost into slush, which the windshied wiper can quickly clear away for safe driving visibility. Please send in the convenient coupon.

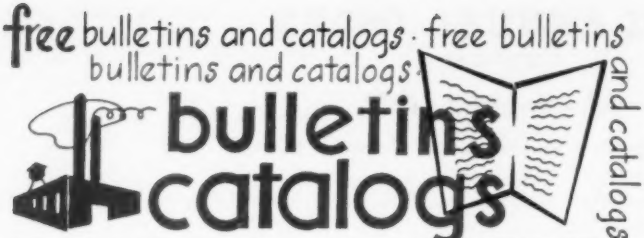
FLASHING DISPLAY

THE DAV-SON "Safety Director" is an illuminated changeable letter bulletin board designed to warn employees to avoid plant hazards. Flashing red and green "traffic lights" attract attention to the important safety notices which can be changed periodically.

The message panel can be quickly removed from the chrome frame for convenient re-setting of changeable letters which are supplied with the display. 98 3½" red translucent letters and figures, and 250 1⅞ black letters and figures are included.

New circular containing complete description of the "Safety Director" together with suggestions for display locations and several examples of safety bulletins is now available, by sending in the coupon.

free bulletins and catalogs · free bulletins and catalogs



New publications of manufacturers are offered by SAFETY ENGINEERING Reader Service Department as a convenience to executives. Featured catalogs, data sheets and technical bulletins present the latest information on protective products and equipment.

EYE PROTECTION

How to Set Up & Conduct a Safety RX Program 1

American Optical Co. A new 14-page booklet containing information useful to any concern planning to establish or expand a program of eye safety through the use of prescription safety goggles. Includes suggestions on how to obtain the necessary professional services for such a program and step-by-step instructions on the use of a new Safety Rx Order Book. Information is based largely on existing successful practices in some of the country's safest industrial plants. This illustrated booklet is a must for every safety director, since every industry is faced with eye corrective-protective problems.

Lens Cleaning Cabinets 2

The Wilkins Co. Are your employees going around befogged simply because there is no provision for keeping their glasses, goggles, face shields, etc. clean? The Wilkins Co. has the answer in their lens cleaning cabinets and accessory equipment, as described in a new 4-page pamphlet. The well illustrated folder points out that clean lenses promote both safety and efficiency. The operation of the K-LENS-M dispenser cabinets is described in detail, typical applications are listed, and directions for obtaining free samples of the cleaner fluid and tissues are given.

SAF-I-SHIELD All Purpose Safety Goggles 3

United States Safety Service Co. "Better Eye Protection at Less Cost" is the theme of a 2-page bulletin describing the light-weight plastic safety goggles which can also be worn over prescription spectacles. The bulletin outlines the two types of ventilation openings, regular and extra ventilation; and points out that both types are available in clear plastic, green anti-glare plastic, and clear lens with green side shields. Also described is the new metal case for safely storing the goggles.

RESPIRATORY PROTECTION

Oxygen Breathing Apparatus 4

Scott Aviation Corporation. A 4-page bulletin which describes the amazing versatility and efficiency of the Scott Air-Pak Safety Breathing Equipment, as used by fire departments, mines, chemical plants and many other industries, even for underwater emergency repairs. Both the self-contained and the extension hose types are described and illustrated. Considerable space is also devoted to the new Scott Demand Inhalator which allows oxygen to flow at any amount desired by the patient. Available in several portable types for resuscitation work, the inhalator is notable for its low breathing resistance.

Air Contamination Analyzer 5

Mine Safety Appliances Co. LIRA, an infra-red analyzer for measuring atmospheric contamination and precise process control, is the subject of a new 4-page illustrated brochure. Based on the principle that most gases, vapors and liquids absorb infra-red light in a certain portion of the spectrum, the infra-red absorption of the air sample in a tube is compared with that of a standard filter tube. The instrument permits the detection of very low gas concentrations.

FIRST AID EQUIPMENT

First Aid Care of Wounds 6

Hynson, Westcott & Dunning, Inc. A 16-page pocket manual on the first aid care of wounds, with emphasis on the value of Mercurochrome as an antiseptic. Written for the layman, the booklet gives basic information for first aid emergencies. Line drawings help illustrate the correct way to treat and dress various types of common wounds.

LABORATORY EQUIPMENT

Castaloy Laboratory Appliances 7

Fisher Scientific Co. & Eimer and Amend. A well illustrated 222-page catalog describing the various laboratory devices made from "Castaloy," a non-ferrous die casting alloy which resists rust and corrosion. Complete details are given on the wide variety of holders, clamps, supports and accessories. Excellent photographs show typical applications of these modern, improved laboratory devices.

FLOOR MAINTENANCE

Proper Care of Floors 8

West Disinfecting Co. Every type of floor and floor surface is discussed in this new 32-page booklet. Part 1 of the illustrated brochure covers the triple process of floor preservation: cleaning, sealing, and maintaining. Part 2 discusses all types of floor surfaces, new and old, and the best methods of maintenance. A handy chart shows at a glance the proper types of cleaner, sealer and maintainer to be used on each of the several kinds of floors.

FIRE PROTECTION

Fire-Retardant Paint 9

Stallton Chemical Corporation. A 6-page folder describing Flame-Seal, a revolutionary coating which will not burn. The paint has been approved by Underwriters' Laboratories, N. Y. City Board of Standards and Appeals, Canadian Standards Association and numerous other testing organizations. The folder has pictures of actual fire tests, lists typical uses for protecting combustible surfaces, and describes in detail this non-burning, non-toxic paint which remains usable indefinitely for either brush or spray equipment.

Fire Alarm System 10

Fire Signal Sales Co. This illustrated 4-page folder describes the Callahan Fire Finder, a mercury-tube thermostatic switch which has been approved by Underwriters' Laboratories for detecting fires. Electric circuits sound an alarm and indicate the location of the fire on a central signal board. Suitable for hotels, ships, business and industrial buildings, the alarm circuits will automatically switch over to battery power if the normal electric supply fails.

Dry Chemical Fire Equipment 11

Ansul Chemical Co. A new 20-page catalog describes and illustrates the complete Ansul line of dry chemical fire equipment which is especially effective against fires in flammable liquids and gases and fires in electrical equipment. In addition to giving full details of construction and operation of the various hand extinguishers, the catalog covers wheeled extinguishers, piped systems, large stationary units, fire trucks, trailers, etc. It also features a chart showing characteristics of approved hand fire equipment and comparative effectiveness graphs, as well as complete information on domestic and foreign distributor's offices.

ELECTRICAL EQUIPMENT

Electrician's and Repairmen's Equipment 12

Martindale Electric Co. A new complete, 64-page catalog which describes and prices the hundreds of electrical and mechanical devices and equipment handled by this firm. The catalog is divided into six general divisions: Production Equipment, Commutator Maintenance, Motor Maintenance, Electrical Maintenance, Safety Equipment, Mechanical Maintenance. Among the highlights of the new catalog are rotary burs & files, mica undercutting saws, slot scrapers, adjustable bench growlers, ammeters, voltage testers, marking tools and industrial vacuum cleaners.

Electronic Controls 13

Photoswitch Inc. A 64-page booklet with excellent drawings to explain the application and operation of electronic and photoelectric controls. It consists of a series of case studies of typical installations which have solved industrial control problems, such as automatic machinery, beverages, chemicals, dairies, foundry pouring, grinders, metal working, paint spray, paper, alarms, punch press protection, smoke detection, etc. An index listing applications alphabetically and by industry assists in finding information on specific problems.

SCAFFOLDING EQUIPMENT

Sectional Scaffolding 14

Wilson-Albrecht Co., Inc. A 6-page illustrated folder describes the basic units and adaptations of sectional steel scaffolding. The scaffolding has been tested for 50 lbs. per sq. ft. live load and has a safety factor of four. Approved by Underwriters' Laboratories, it is extremely flexible in its uses, both indoor and outdoor. The folder also offers some valuable safety rules to be followed in erecting and using the equipment.

WRITE NUMBERS CORRESPONDING TO THE ITEMS HERE ☞

Your Company Name _____
(Please Print)

Address _____

Your Name _____

Your Title _____

Return This Coupon To:

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January, 1950

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JULY-DECEMBER, 1949
NEW YORK 7, N. Y.

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CO Detector for New Tunnel, 76 Oct.
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  Sodium bicarbonate extinguisher, 20 Oct.
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"Carelessness Increases Fire Losses", 42 July
Carruthers, Arthur C., announces new affiliation, 30 Dec.
Cartoons for safety program, 55 Sept.
"Causes of Occupational Dermatitis", by Louis Schwartz and Donald J. Birmingham, 56 July
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Center for Safety Education Announces Fall Courses, 34 Aug.
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"Check Solvent Safety Before Winter", 82 Oct.
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Chemical causes of dermatitis, 58 July
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  New, 53 Aug., 65 Dec.
  Preparation of, 41 Aug.
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Chlorinated diphenyl oxides, 56 Dec.
Chlorine, 62 Dec.
Chlorobutadiene, dermatitis hazard, 65 Nov.
Chrome tanned leather for protective clothing, 38 Oct.
Chromic acid, 62 Dec.
Chromium,
  Corrosion resistant, 70 Oct.
Cigarettes, cost of, 8 Sept.
Circular saw hazards, 39 Nov.
"City Fire Defenses Weaken as Hazards Increase", 34 Aug.
Clark, Edward A.,
  "Safety Investment vs Safety Returns", 9 July
Cleaning, vacuum, 22 Sept.
Cleanliness,
  Control of insects, 14 Aug.
  In washrooms, 16 July
"Clean-up Rooms Should Be Clean", 16 July
"Clear The Air With Activated Carbon", by J. H. Bartol, 84 Oct.
"Coal Mine First Aid Team Contest", 50 Oct.
Coal mine safety progress, 67 Oct.
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  Safety improvement, 21 Nov.
  Use of coke, 45 Sept.
Colds, preventing, 62 July
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Commercial Standard for Mineral Wool Insulation, 47 Nov.
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Continental Oil's safety program, 55 Aug.
"Control of Wastes in Porcelain Enameling", by Hubert S. Kline, 60 Dec.
Copper-bearing steel, corrosion resistant, 70 Oct.
"Corporation Set Up to Market Absorbents", 72 Dec.
Corrosion, prevention, 28 Oct.
Cosgrove, John N.,
  "A Safe Office", 27 Dec.
"Cost of Apathy", 24 Nov.
Counters, radioactivity, 37 Dec.
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  At N.Y.U., 44 Aug.
  Center for Education, 34 Aug.
  Nuclear safety course, 42 Dec.
  Public Utility safety course held, 23 Aug.
  Traffic training, 30 Dec.
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Crane cabs, safer, 55 July
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  Utilizing idle periods, 60 Nov.
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"Custom-Built Safety Committee Program, A", by Everett W. Graham, 18 July
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"DDT for Bugs—DDD for Humans", 30 July
"Dark Streets Dangerous", 33 Sept.
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  Chemical, 41 Aug., 65 Dec.
Davidson, Thomas D.,
  "How to Protect the Hands and Feet", 14 Sept.
"Death Strikes at Night", 26 Dec.
Decatur Casting Co. Shows Its Record, 46 Dec.
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"Dermatitis In The Rubber Industry", by Dr. Louis Schwartz, 62 Nov.
Dermatitis, barrier lotion for, 65 Dec.
Disability from Dust, 66 Dec.
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"Distinct Insects", 58 Aug.
"Documentation", 67 Sept.
"Does Clothing Protect?", 71 Oct.
"Dollars and Sense of Vacuum Cleaning, The", 22 Sept.
"Donora", 68 Dec.
Drew, Philip Tyndale,
"Preventing Accidents in Britain. .", 17 Dec.
Driver injuries, 60 July
Driving awards, 27 Aug.
Driving, defensive, 25 Aug.
Driving tests, 32 Sept.
Dry Chemical, fire extinguisher, 18 Oct.
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"Dust Control Engineers", 82 Oct.
Dust control,
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Dust removal, 23 Sept.
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Disability from, 66 Dec.
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Consultant on, 46 Aug.
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"Easy Ways to Store Rock Salt", 30 Nov.
Ebasco Holds Second Safety Seminar, 23 Aug.
Ebasco Operating Men "Talk Back", 32 Dec.
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Education in safety, need, 24 Nov.
Educational Aids to Safety,
"Block that Alibi", 9 Aug.
"How To Prevent Injury Through Accident Prevention Programs", 26 Sept.
"Movies Can Show Them the Safe Way", 12 July
Educational Value of Materials Handling Show, 50 Aug.
"Electric Eyes See the Dangers", by Ernest Jellinek, 11 Aug.
Electric shock,
Arc welding, 24 Oct.
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"Safe Lighting with Explosion Proof Fittings", 14 Dec.
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Electronic Safety Devices, New Sales Division for, 79 Oct.
Elevator inspection, 28 Nov.
Elevator safety, 28 Nov.
Emergency lighting protection, 16 Nov.
"Ether Fires Take a Beating from Dry Chemical", by William F. O'Connor, 18 Oct.
Evans, Eddie E. and Williams, Albert E.,
"Marine Corps Air Station Attacks Accidents", 15 Oct.
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"Eye Conference", 81 Oct.
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"Fire Control for Flammable Liquids", by E. A. Anschicks, 18 Dec.
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"Fire Fighting and Radiation", 21 July
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Increase, 54 Aug.
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"Fire Hydrant Problems", 47 Dec.
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"Fire Control for Flammable liquids", 18 Dec.
"How to Keep Your Fires Small", 18 Nov.
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"Fire Protection for Gas Trailer Truck", 26 Dec.
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"Florida Weather-Testing by N. Y. Labora tory", 49 July
Flue safety by electric eye, 11 Aug.
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Fluorine, welding hazard, 64 Oct.
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"For Safety's Sake", 32 Sept.
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"From the Mouths of Patients", 68 Nov.
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Gaskin, Mervyn G.,
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Trailer-truck fire protection, 26 Dec.
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Goldberg, Jacob A.,
"Industrial Hygiene", 53 July, 61 Aug., 63 Sept., 82 Oct., 62 Nov., 58 Dec.
Graham, Everett W.,
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Gray Iron Society—Safety campaign, 28 July
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Great Physician, A, 90 Oct.
Greene, W. Sherman, Jr.,
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"Gro-Cord Increases Its Service", 48 Dec.
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Guard rails and toeboards, recommendations, 16 Oct.
"Guardian Safety Equipment Co.", 50 July
Guards for Machines,
"How to Use Woodworking Machine Guards", 16 Sept.
Power Press Guards, 26 Nov.
"Put the Hazards Behind Bars", 16 Oct.
See also Machine guarding, 17 Dec.
"Guides to the Handling of Chemicals", by D. O. Mason, 16 Aug.
Gulf Coast Industrial Health Conference, 40 Sept.

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Hand protection, 14 Sept.
Hand tools, safety program, 34 July
Handicapped workers, 47 Nov.
Handling,
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Harrold, Gordon C.,
"How to Handle Chemicals Safely", 12 Dec.
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Dangers of, 40 Nov.
Dust and fume removal bulletin, 55 July
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"Health Plan of A.M.A., 91 Oct.
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Heavy load, accident, 55 Dec.
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Holophane Elects VP in Charge of Research, 31 Dec.
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"Hose for Mines, New", 53 Dec.
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Housekeeping, good,
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"How to Control Fumes", by Walter E. Langlois, 18 Aug.
"How To Control Industrial Insects", by H. Richard Rich, 14 Aug.
"How to Engineer Machines for Their Operators", 24 Dec.
"How To Handle Chemicals Safely", by Gordon C. Harrold, 13 Dec.
"How To Keep Your Fires Small", by Dawson Powell, 18 Nov.
"How To Keep The Lights on During An Emergency", by J. B. Brown, 16 Nov.
"How to Maintain Fuses Properly", by Howard I. Podell, 22 July
"How to Prevent Injury Through Accident Prevention Programs", by Donald Monroe, 26 Sept.
"How to Prevent Rust", by John A. Howland, 28 Oct.
"How to Protect the Hands and Feet", by Thomas D. Davidson, 14 Sept.
"How to Reduce Eye Injuries", 44 Nov.
"How Safe Is An Elevator?", by James F. Skamarak, 28 Nov.
"How to Say It With Safetygrams", by W. H. Watts, 19 Sept.
"How to Use Woodworking-machine Guards", 16 Sept.
Howland, John A.,
"How to Prevent Rust", 28 Oct.
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"Industrial Nurse, The", by Rosamond J. Webster, 62 July, 66 Aug., 67 Sept., 89 Oct., 67 Nov., 66 Dec.
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"Influence of Temperature, The", 67 Nov.
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"Inter-American Congress Postponed", 6 Aug.
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"Is Coal Mining Safe?", by Henry C. Woods, 21 Nov.
"Is Television Safe?", 40 Aug.
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"Are Safety Meetings Worthwhile?", 15 Nov.
"Make Safety Meetings Count", 11 Dec.
List of ASA standards, new, 48 Aug.
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"Constructive Applications of Atomic Energy", 64 Aug.
"Discussion of Industrial Accidents & Diseases", bulletin, 47 Nov.
"Human Factors in Engineering Design", 24 Dec.
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"Manual on Toxic Eye Hazards", 63 Aug.
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"Telling the Story of Engineering Research", 81 Oct.
"Tuberculosis in Industry", 62 Aug.
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Management Changes at Pittsburgh Plate Glass Co., 40 Dec.
"Marine Corps Air Station Attacks Accidents" by Albert E. Williams and Eddie E. Evans, 15 Oct.
Martin, Everett W.,
"Let's Bury Safety . . . In Our Hearts", 38 Sept.
Masks for pilots, 52 July
Mason, D. O.,
"Guides to the Handling of Chemicals", 16 Aug.
Material, poorly stacked, 57 Aug.
Materials Handling Show, educational value, 50 Aug.
"Measuring Industry's Protective Clothing Needs", by Roy S. Bonsib, 36 Oct.
"Mechanical Handling for Safety and Savings", 25 Aug.
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"Medical Care",
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"Merrill Bros. Open New Sales Outlets", 52 July
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"Movies Can Show Them the Safe Way", by W. Sherman Greene, Jr., 12 July
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"New Developments in Liquid-Proof Protective Clothing", by D. M. Raleigh, 12 Aug.
"New Division of Public Health Service, 65 Dec.
"New Hazards Need Control", 62 Aug.
"New Instruments Needed for Atomic Power", 21 Sept.
New Name for an Old Company, 50 Sept.
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Abrasive, Ideal Flexible, 95 Oct.
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Carboy drainer, safety, 71 Aug.
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Fluorescent tube disposal unit, 71 Dec.
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Gearshift drives, "Selective-speed", 71 Nov.
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Low cost cover makes large oily waste can, 95 Oct.
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Safety glasses protect against impact, explosion, 71 Sept.
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Safety spec with detachable temples, 94 Oct.
Salt tablets, impregnated, 66 July
Saw guard, plastic, 93 Oct.
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Steel drawer cabinets for small parts, 71 Sept.
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Tuf-cote cover lenses, 71 Aug.
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Nickel alloy,
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Nitrogen dioxide, 58 Dec.
No barricade, accident, 56 Nov.
"Noise and Health", 66 Aug.
Nuclear Safety Course, 42 Dec.
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O'Connor, William F.,
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Oil Association Elects, 42 Sept.
Oil Fire Systems, 20 Nov.
"Oil-Fire Movie", 53 Aug.
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"Paints Reintroduced", 42 July
Parrott, Captain J. N.,
"Traffic Survey in San Salvador", 30 Oct.
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"Pallets Cut Losses", 30 July
Patent Scaffolding Co., Midwest Branch, 59 Nov.
"Penicillin, The Use of", 68 Sept.
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"Personalized Safety Service", 20 Sept., 32 Oct., 20 Nov., 20 Dec.
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"How to Control Industrial Insects", 14 Aug.
"How to Prevent Rust", 28 Oct.
"The Dollars and Sense of Vacuum Cleaning", 22 Sept.
"Plant Hygiene", 6 Aug.
Plant Maintenance Show, 52 Dec.
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Podell, Howard L.,
"How to Maintain Fuses Properly", 22 July
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Power plant safety,
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Power Press Guards, 26 Nov.
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"Preventing Accidents in Britain . . ." by Philip Tyndale Drew, 17 Dec.
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